This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

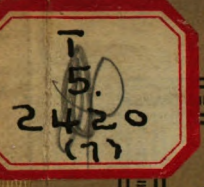
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

HARVARD UNIVERSITY
LIBRARY OF THE GRADUATE SCHOOL
OF EDUCATION



KD 36477

Suggestive Lessons in Numbering

Arranged for Individual Work

SEVENTH GRADE

BY

MARGARET M. CAMPBELL, M. A.
Department of Mathematics, Junior High School
University of California, Southern Branch
Los Angeles

1922
HARR WAGNER PUBLISHING CO.
San Francisco
California

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

SUGGESTIVE LESSONS IN NUMBERING

Arranged for Individual Work

SEVENTH GRADE

MARGARET M. CAMPBELL, M. A.

Department of Mathematics, Junior High School
University of California, Southern Branch
Los Angeles

April 15, 1922

HARR WAGNER PUBLISHING CO.
San Francisco
California

Digitized by Google

KD 36477

June 22, 1923
HARVARD UNIVERSITY
LIBRARY OF THE GRADUATE SCHOOL
OF EDUCATION

UNIVERSITY
LIBRARY
4878

Copyright 1922
By Harr Wagner Publishing Co.

Digitized by Google

PREFACE.

These lessons are planned to use with the California State Series, and so are not complete in themselves, but they show possibilities of securing material from other divisions of the curricula. So close is the relation between arithmetic and the other branches of knowledge, that it might be said that only the mastery of the fundamental processes should be designated arithmetic, for the application belongs wherever quantitative thinking is desirable. The importance of finding favorable opportunities for this kind of thinking cannot be over-emphasized, and nowhere are they more auspicious than along the lines of the pupils' present interests and needs.

In consideration of the pupils' individual abilities and differences, the arrangement as well as the graded steps both in the separate lessons and the series as a whole is such that they may progress each at his own rate of speed and with his own degree of doing. The essential points are that each pupil feels an inner urge to do, and that he develops his own power by such activity.

M. M. C.

April 15, 1922.

Digitized by Google

Digitized by Google

TABLE OF CONTENTS.

Lesson		Page
	Graphing.	
I.	Line Graphs—Record of Work—Prices—Trains	7
II.	Bar and Circle Graphs	9
III.	Records Showing Comparative Abilities of Individuals	11
	Project—Paul's Chicken Investment.	
IV.	Scale Drawing—Fencing	14
V.	Building Chicken House—Securing Money	16
VI.	Buying Equipment	17
VII.	Keeping an Account	18
VIII.	Sowing an Alfalfa Patch	19
IX.	Record of Eggs	21
X.	Studying "Ads"—Procuring Chicks	22
XI.	Paul's Class Has a School Picnic	23
XII.	Paul Furnishes His Room	25
	Carrying Papers.	
XIII.	The Los Angeles Times	26
XIV.	The Los Angeles Examiner	28
	Arithmetic Used in Department Store.	
XV.	Knowledge Needed by Various Employes Salespeople	30
XVI.	Paymaster and His Work	33
XVII.	Office Employes—Discount	34
XVIII.	War Taxes	37
XIX.	Timekeeper and His Duties	39
XX.	Salary Per Cent	43
XXI.	Quota of Employes	45
XXII.	Necessary Records of Employes	47
	Study of Industries.	
XXIII.	Selecting a Farm Business	49
XXIV.	Estimating Costs	51
XXV.	Comparative Study of California's Leading Tree Crops	53
XXVI.	Starting a Walnut Orchard	55

Digitized by Google

Lesson		Page
XXVII.	Income from Bearing Orchard	58
XXVIII.	Walnuts Produced and Imported	60
XXIX.	Growingt the Grape	62
XXX.	Establishment and Upkeep of Vineyards	64
XXXI.	Raising Figs	67
XXXII.	California Grapes and Imports	69
	A Bond Issue.	
XXXIII.	Building School Lockers	71
XXXIV.	Selling Bonds	73
	Food Values.	
XXXV.	Measuring Food	76
XXXVI.	Measuring Food	78
XXXVII.	Suitable Amounts of Food	80
XXXVIII.	Food for Workers	83
XXXIX.	Finding Value and Cost of Recipes	84
XL.	Comparison of Tea, Coffee and Cocoa	87
XLI.	Fruit Cookies—Chocolate Fudge	90

Digitized by Google

LESSON I.

1. (a) Make a rectangle that is 5 inches long and 4 inches wide. (b) Divide this into ½-inch squares. (c) How many squares in the first row? How many rows? How many squares in all? (d) Beginning at the upper left corner, number the squares straight across with the Roman numerals. Always beginning at the left, number the squares in every other row to correspond with the number of the lesson. (c) Cut out this rectangle and attach it to your book or tablet where you can have it throughout the year so that you can keep the record of your arithmetic work on it. (f) Decide on certain ways of marking it to show (1) that you have handed in your paper; (2) that you have corrected all mistakes on your paper; (3) that your paper was perfect the first time you handed it in.

2. (a) Make a large graph sheet that will do to keep the record of the whole class. (b) How many squares across the page shall you need? (c) How many rows of squares are necessary? (d) What else must be allowed for at one end? (e) At the top of the rectangle? (f) What are the dimensions of the large rectangle? (g) What is the size of the square? (h) Use ink in making another of these record sheets on heavy paper that can be posted in the front of the room.

3. Either secure a sheet of squared paper or rule a sheet of unlined paper into ¼-inch squares. (Be as saving as you can with this paper, for if it is bought, it is expensive; if it is made, it requires both time and patience.) (a) Graph these records which were made in the arithmetic drills for a week; John made 8 errors Monday, 6 Tuesday, 4 Wednes-

Digitized by Google

day, 7 Thursday, 3 Friday; Blanche, 4 Monday, 6 Tuesday, 3 Wednesday, 3 Thursday, 2 Friday; Joe, 10 Monday, 8 Tuesday, 6 Wednesday, 8 Thursday, 5 Friday; Opal, 4 Monday, 3 Tuesday, 2 Wednesday, 1 Thursday, 1 Friday; Fred, 5 Monday, 2 Tuesday, 6 Wednesday, 4 Thursday, 2 Friday; Jean, 6 Monday, 7 Tuesday, 8 Wednesday, 10 Thursday, 7 Friday. Plan to make this graph either in the upper left or lower left part of your paper. Why? (b) Along the left side of the part selected, number the squares, beginning at the bottom, from 0–10 inclusive. Why were these two numbers selected? (c) How shall you name the squares, running the other way? Just put the initial letters of the days of the week in the row of squares above the row marked "10." (d) Put points in the right places to show John's record. Connect these points with straight lines. (e) All of these records may be shown on this one small graph if you are careful to connect the points for each pupil in a different way, such as using a straight line for one, broken line for another, series of points for another, series of small crosses for another, or different colors for each one. Be careful to show outside the graph what kind of line represents the record of which pupil.

4. (a) Make a graph sheet showing the price of gasoline in 1 to 15 gallon lots. (b) How shall you number the squares above? (c) How much is gasoline per gallon? (d) Beginning at the top in the square by the side of the one marked "1," write .23; the next, .46; then .69, etc. It might be well to use three squares for each of the prices so as to have enough space for legible figures. (e) Charts giving prices of gasoline and oils are of what advantage to the men who keep oil stations? (f) Can you name any other business where tables or charts would be helpful?

Digitized by Google

5. Train A leaves San Francisco for Los Angeles at 6 p. m. and travels 40 miles an hour; Train B leaves at 1 p. m. and travels in the same direction at the rate of 25 miles an hour; Train C leaves at 8 p. m. for the same destination and travels 60 miles per hour; Train D leaves at 4 p. m. and travels in the same direction at the rate of 30 miles per hour. (a) Make a graph showing the distance each train is from San Francisco at 1 a. m. (b) How many rows of squares are needed? (c) Number the rows at the left, beginning with the bottom one. (d) At the top of the graph let each square represent 5 miles, but number by 10's. (e) Make the graph for each train in such a way that one will know whether it is train A, B, C or D. (f) Give the time and the distance covered by any train that passes any other train. (g) How can you show that your graph is correct?

LESSON II.

Instead of drawing a line for the graph, bars may be used. They may be horizontal or vertical, and may be placed close together or with a space between.

1. The prices of the various cars in March, 1922, are as follows:

1. Ford	$ 578	23. Lexington (7)	$2,685
2. Chevrolet	675	24. Packard, Single Six	2,690
3. Maxwell	1,070	25. Wills St. Claire	2,770
4. Essex	1,095	26. Franklin	2,775
5. Dodge	1,125	27. Haynes, 75	2,790
6. Scripps-Booth	1,195	28. Cole	2,795
7. Oakland	1,365	29. Standard Eight	2,885
8. Nash (7.)	1,825	30. Apperson	2,995
9. Reo (7)	1,825	31. Peerless	3,170

Digitized by Google

10. Buick (7)	1,875	32. Stutz	3,350
11. Chandler (7)	1,985	33. Cadillac	3,350
12. Oldsmobile, Twin 4	1,985	34. Ford-Lincoln	3,750
13. Stephens Six	2,050	35. Winton	3,825
14. Hudson (7)	2,050	36. Marmon	4,270
15. Studebaker, Big 6.	2,095	37. Packard, Twin Six	4,290
16. Kissel (7)	2,385	38. Mercer	4,445
17. Jordan	2,430	39. Lafayette	4,550
18. Templar	2,500	40. Dorris	5,500
19. Paige (7)	2,535	41. Cunningham	7,000
20. Westcott (7)	2,590	42. McFarlan	7,025
21. Stearns-Knight	2,680	43. Pierce-Arrow	7,062
22. H. C. S.	2,685	44. Locomobile	8,200

45. Rolls-Royce.....$16,550

(a) Make bar graphs to represent the prices of these cars by letting one square stand for $200. (b) How many times is $200 contained in $578? Call it 2.9 times. (c) How many squares will represent the Ford? Make this bar any width you please, but remember all are the same. (c) Copy the table of prices so that the number on the graph will correspond with number in the table.

2. The circle is also used for graphs. The circumference of any circle is divided into 360 equal parts called degrees. (a) Draw a clock face putting the numerals in the correct places. (b) When the minute hand has traveled from 12 to 6, through how many degrees has it passed? (c) When it has traveled from 6 to 9? (d) From 12 to 3? (e) From 12 to 1? From 9 to 11?

3. (a) In using the circle for a graph, the statistics are usually given in per cent. How many degrees represent 50%? (b) 25% is represented by how many degrees? (c) 75%? (d) The space between 12 and 4 represents how many degrees? What per cent does it represent? (e) The

Digitized by Google

space between 12 and 1 represents what per cent? (f) How could you find what would represent 4%?

4. (a) Draw a circle and graph the composition of milk if the ingredients are as follows: protein 2.2%, carbohydrates 5%, fat 4%, minerals .4%, water 87.7%. (b) Shade each portion of the circle differently, and explain at the side what each represents.

5. (a) Draw a circle to show the composition of peanuts: fat 29%, protein 19%, water 7%, carbohydrates 19%, ash 2%, refuse 24%. (b) Shade each portion differently, and explain what each represents.

6. From various estimates by different writers the average elementary composition of the human body may be presumed to be as follows: Oxygen 65%, carbon 18%, hydrogen 10%, nitrogen 3%, calcium 2%, phosphorus 1%; many elements such as sulphur, sodium, chlorine, etc., 1%. (a) Graph the composition of the body. (b) Explain what each part represents.

7. It has been estimated that a person with an average income spends his dollars as follows: food 30%, house and heat 24%, clothes 12%, housekeeping expenses 5%, miscellaneous and savings 29%. (a) Use a circle to graph this, but try to show that it represents a divided dollar. (b) Explain each part.

LESSON III.

1. You have learned to make the three kinds of graphs. (a) Could any kind of information be pictured as well with all three kinds? (b) Then what are you supposed to do when you are asked to make a graph of any statistics? (c) Which graph would be better to show the change in prices of articles from year to year? (d) Which

Digitized by Google

to show per cents? (e) Which is preferable to show comparisons, such as population of cities?

2. Pupils always like to know how their work and their ability compare with that of the other pupils of the same grade. This is a method that was used to give this information to one seventh-grade class. (a) Supply yourselves with one or two sheets of squared paper. (b) Begin at the upper left corner and allow yourself a working space that is about 4″ x 4″. (c) At the top of this space, allowing two squares for each, write or print these words: Writing, spelling, reading (comprehension), reading (rate), composition (style), composition (form), language, arithmetic (principles), arithmetic (correct answer), geography. (d) About two-thirds of the way down in the space reserved, draw a straight line from left to right.

3. This straight line represents the "median," which is another name for the one who stands in the middle. These figures are the scores made by this person when he took the standardized tests in these subjects. (a) Write these figures on the line in the correct space: Writing 52, spelling 87, reading (comprehension) 29, reading (rate) 114, composition (style) 65, composition (form) 5.8, language 19, arithmetic (principles) 15, arithmetic ("C.") 10, geography cities 12, geography States 16. (b) This record shows the work of one who stood half-way between the median and zero work. Place these points and then use lines to connect them: Writing, 2 squares below (44), spelling, 3 squares below (60); reading (comprehension), 2½ squares below (25); reading (rate), 2½ squares below (94); composition (style), 3 squares below (56); composition (form), 4 squares below (1.2); language, 2 squares below (15); arithmetic (P.), 2 squares below (10); arithmetic ("C."), 1½ squares below (8.12); geography (C.),

Digitized by Google

2 squares below (6); geography (S.), 2 squares below (10).

4. This record was made by one who stood half-way between the median and perfect work. (a) Place points for each record. (b) Use lines to connect points: Writing, 2 squares above (65); spelling, 1 square above (97); reading (comprehension), 2½ squares above (34); reading (rate), 3 squares above (144); composition (S.), 3 squares above (7.4); composition (F.), 2 squares above (7.4); language, 3 squares above (24); arithmetic (P.), 1½ squares above (18); arithmetic (C.), 2 squares above (12); geography (C.), 1 square above (16); geography (S.), 2 squares above (23).

5. You will notice that the measuring unit in the graph changes with each subject. (a) What is the difference between the median and the lowest score for writing? (b) This is represented by how many squares? (c) One square equals how many points? (d) What is the difference between the median and the lowest score for spelling? (e) This is represented by how many squares? (f) One square equals how many points? (Disregard all unequal parts and fractions. For example, the score of 65 in writing is 13 more than 52, and this 13 was graphed as though it were 12.

6. Make the median score, the lowest score and the highest score for a background for this pupil's record. (a) Robert A.: Writing 43, spelling 92, reading (comprehension) 29, reading (rate) 139, composition (style) 50, composition (form) 5.8, language 22, arithmetic (P.) 15, arithmetic (C.) 16, geography (C.) 16, geography (S.) 15. Make points and lines for this record with a colored pencil or crayon.

7. (a) Make a background for this record. (b) Make points. (c) Use lines to connect points. Kenneth B.:

Digitized by Google

Writing 38, spelling 51, reading (comprehension) 39, reading (rate) 139, language 21, arithmetic (P.) 20, arithmetic (C.) 9, geography (C.) 6, geography (S.) 8.

8. (a) Put in the median, the lowest and the highest scores. (b) Locate points. (c) Draw line. Charles B.: Writing 44, reading (comprehension) 31, reading (rate) 139, composition (S.) 51, composition (F.) 10.2, language 9, arithmetic (P.) 11, arithmetic (C.) 9.

9. (a) Make the median, the lowest and the highest scores for each of these records. (b) Locate points. (c) Draw the connecting lines. (d) Laura G.: Writing 60, spelling 92, reading (comprehension) 37, reading (rate) 129, language 28, arithmetic (P.) 22, arithmetic (C.) 14, geography (C.) 14, geography (S.) 21. (e) Virginia H.: Writing 72, spelling 100, reading (comprehension (40), reading (rate) 139, language 29, arithmetic (P.) 15, arithmetic (C.) 10, geography (C.) 10, geography (S.) 12.

10. (a) Have your teachers give you these tests and copy your scores. (b) Mark the median, the lowest and the highest scores. (c) Locate the points for your scores. (d) Use lines to connect the points. (e) Which record that you have graphed is most nearly like yours?

LESSON IV.

1. Paul's father owns a lot 50 ft. by 150 ft. Draw this to scale. (a) If 1″ stands for 1′, what will be the size of your drawing?

(b) If ½″ stands for 1′, find size of drawing.

(c) If 1″ stands for 2′, the size of the drawing is.....

(d) If 1″ stands for 3′, the size of the drawing is.....

(e) If 1″ stands for 5′, the size of the drawing is.....

(f) If 1″ stands for 10′, the size of the drawing is.....

Digitized by Google

(g) State scale that you used in your drawing.

2. Paul has been promised one-sixth of the lot (at the rear) for chickens. Show the chicken lot in your drawing.

3. Wire netting is needed for the chicken yard. (a) How wide should it be? (b) How many yards should be bought to fence a yard 15′ by 25′? If it is bought at the price now, how much will it cost Paul?

4. Paul discovered that he could get a good grade of second-hand netting at one-fourth off. If he decides to take this, how much will it cost?

5. The chicken wire could be put on the fence on three sides of his yard, but he must buy new posts for the fourth side. How far apart should these posts be? How many will he need if an 8-ft. garage stands on line of this part of the fence, and an extra one be bought for a gate post? What would be the cost of them at the nearest lumber yard?

6. Paul's older brother has promised to work for Paul at 35¢ an hour. If he can dig 4 post holes in an hour, how much will Paul owe him for this part of the work?

7. The posts of the regular fence are not high enough to support the wire net. His father has advised him to nail on extension strips, and he finds he can buy them for 6¢ apiece. If the regular posts are 6 ft. apart, how many of these strips will he need? How much will they cost?

8. If he buys 95¢ worth of nails and staples, a pair of hinges for an old gate that he can use, what is the entire cost of the fence?

9. Paul sells papers. He finds he was able to save 25¢ on Monday, 10¢ on Tuesday, 40¢ on Wednesday, and 15¢ on each of the other days excepting Sunday. He began work January 2, and it is now May 1. Did he have enough money to pay his expenses? What was his balance?

Digitized by Google

LESSON V.

1. An old building can be used for the chicken house if Paul buys new lumber for two sides. The sides of this building are made of 10-inch planks with a batten strip over the cracks. The building measures 10′ by 8′ and is 6′ high. One end and one side are to be rebuilt. How many board feet of 10-inch lumber will be needed? How many feet of batten strips?

2. What is the price of 10-inch lumber? Of batten strips? How much must Paul pay for what he needs?

3. He also needs lumber for the chicken roosts. What kind should he get, and how much should he pay for it?

4. What can he do for nests? If he puts in six of the kind you suggest, how much will they cost him?

5. He needs new hinges on the door. How much should he pay for them?

6. If he spends 65¢ for nails, what is the total cost of his chicken house?

7. How much has his entire project cost him so far?

8. Paul's money is now about used up, and he does not want to wait until he can earn enough to buy his chickens. His father has consented to lend him $30 if Paul will give his note and agree to pay his father interest at the regular rate. (a) Make this note as though it were you instead of Paul borrowing this money. (b) Make the note as you would if you were making it for Paul.

9. If Paul keeps this money one year, how much interest must he pay? How much for 6 months? For 4 months? 3 months? 1 month? 5 months? 7 months? 9 months? 8 months and 15 days?

10. Paul has $20 in the School Branch of the Bank of

Digitized by Google

Italy. How much could he save by using this if he thinks he will not be able to repay his father for 8 months?

11. If he still is able to save the same amount from the papers, about how many weeks would it take him to save the necessary money?

12. If you were Paul, what should you decide to do? Why do you think it the best plan?

LESSON VI.

1. Paul has decided to spend about $25 for young hens. He would like to have at least a dozen to start with, and then later he will buy twelve more. He finds he can buy 6-month Rhode Island Red pullets for $1.75 each. (They will begin laying in two months or so.) Laying Aconas are $2 each. One of his neighbors will sell him three White Leghorns (laying) at $1.60 each. Eight-month Barred Rocks that should lay in two or three weeks are $2.25 each. How many and what kinds should you advise him to buy? How much will they cost him?

2. Besides the table scraps he will need two other kinds of feed—scratch and a laying mash. He can get the former for $2.75 for 100 lbs. or $1.60 for 50 lbs. or any amount at 3¾¢ a pound. The laying mash is $2.85 for 100 lbs. or 35 cents more than half that amount for 50 lbs. or 4½¢ a pound. How much of each shall he buy and what will it cost?

3. He also buys 1½ lbs. of shells at 7¢ a pound. How much has all of the chicken feed cost him?

4. If he buys this feed from R. P. Risher and Co., 6153 Santa Monica Blvd., make out the kind of sales slip that this firm would be likely to give him.

5. Write a check on one of our banks for the amount.

Digitized by Google

6. Paul's school had a chicken show, and he entered some of his hens. When the prizes were awarded, he found that he had first prize (75¢) on a Rhode Island Red, second prize (50¢) on one of his Rocks and third prize (25¢) on a White Leghorn. How much did he receive in prizes from the school?

7. Later he entered some chickens at the Live Stock Show, and he received these prizes: $3 on a Rhode Island, $2.50 on an Ancona and $1.25 on a White Leghorn. These prizes would decrease the cost of the Rhode Island Reds how much? What would be the average cost of these chickens? Of the Rocks? Of the Anconas? Of the Leghorns?

8. This prize money is what part of the amount that he spent just for the chickens?

LESSON VII.

1. Paul wants to know if he is really making money with his chickens, and so he has decided to keep an account of everything. Get a little memorandum book to keep a similar account. Take two opposite pages, and on one write "Money Paid Out"; on the other, "Money Received." See that there are three lines drawn from the top to the bottom on the right-hand side of each page (for dollars and cents). Name all the things for which Paul has spent money and the amount spent.

2. On which side shall you put what he earned by selling papers? How much was this? Where do you put what he borrowed from his father? What else is placed on this page? (Try to get just a word or two that will explain the different items.)

3. How much has he paid out? How much has he

Digitized by Google

received? What is the difference between these two amounts? (This is called a "balance.") On which page is this balance written? Why?

4. Paul's father has offered to buy the paint for the chicken house, but Paul must do the work. If one-half gallon will cover about 20 square yards, how much paint shall Paul tell his father to bring, if there are to be two coats? A straight roof projecting 9 inches each way is to be painted also.

5. How much would this cost at the price paint is now?

6. On school days Paul worked at this painting from 7 a. m. till 8 a. m. and from 5:30 p. m. till 6:15 p. m. And on Saturday he worked from 7:30 a. m. till 10:15 a. m. and from 1:15 p. m. till 3:30 p. m. If he worked school days for two weeks and one Saturday, how much time did he spend painting?

7. A regular painter could have done it in about one-third of the time. If a painter receives $4.50 for an 8-hour day, how much would it have cost Paul's father to have it painted?

8. A builder in the block has offered Paul some gravel if he will haul it away. Paul has offered his chum 12½¢ an hour to help him. They find it takes 25 minutes to wheel one load over. If they get 9 loads, how much will he owe his chum?

LESSON VIII.

1. Paul has decided that he wants a little alfalfa patch so as to reduce the cost of feed. (a) Make a drawing showing which part of the chicken lot could best be used in this way. (b) Give two reasons for your selection.

Digitized by Google

2. Shall he need another fence? (a) If so, make two good problems about it. (b) Solve these problems.

3. How large should this alfalfa plot be? What is its area in square feet?

4. How much alfalfa seed will it take if the seed catalogue says to allow 1 lb. for about 2,000 sq. ft.?

5. What will be the cost of this seed at 45¢ a lb. and 10¢ for delivery?

6. Paul has decided that he will keep a record of his eggs each day, and so he ruled a square, making it a little calendar except that he left room under each date to put the number of eggs for that day. The first day of the month was Saturday, and these figures represent the eggs he got each day: 1, 0, 3, 1, 3, 5, 2, 6, 3, 1, 5, 5, 2, 7, 3, 4, 3, 2, 7, 4, 4, 5, 2, 3, 6, 5, 2, 7, 3, 6, 8. You make a record like Paul's.

7. How many eggs did he get in that month? How many dozen?

8. His mother took the first dozen and his aunt the second dozen at 2 cents more a dozen than they were paying at the market. He sold the rest to neighbors at local prices. If he were selling them this month, how much should he receive for these eggs?

9. Could you suggest a better way for Paul to keep his record of eggs? Make a drawing showing your suggestion.

10. Paul has decided that he would like to know how many eggs he gets from each kind of hen. (Remember, he has four kinds.) How could he keep such a record as this?

11. Do you think it is necessary to keep any kind of a record? Give two reasons for your answer.

12. (a) On which page of your memorandum book shall you write what he received for his eggs? (b) Should

Digitized by Google

it be in one or two items? Why? (c) Make these entries.

13. Are there any other entries to be made at this time? What are they?

14. What is the last balance in this bookkeeping? Show on your paper how you got this amount.

LESSON IX.

1. Paul's father tells him that this alfalfa plot must be well watered before it can be spaded. This sprinkling will require about 4½ hours. If Paul could get one of the older boys to do it for 35¢ an hour, how much would he save if he did the work himself?

2. A man would charge him 75¢ an hour for spading, and it would take him about 1¾ hours. How much will it cost him to get this work done?

3. It will take Paul twice as long to do it. If his time is only worth one-fourth as much as a man's time, how much could he save by doing it?

4. Paul's mother will not allow him to work at this for more than 30 minutes at a time. At this rate, how many different times will it be necessary for him to work?

5. Paul finds that he can only get in four "turns" in a day. This means that it would take Paul how many days to do this piece of work?

6. Paul has decided that he wants some little chickens. Which would be better for him to buy, twelve little chickens at 25 cents apiece or to pay $1.75 a "setting" (15 eggs) if he is likely to lose ⅖ of the eggs?

7. How much has Paul been able to save of his paper money for the months of May, June and July?

8. If June's record of eggs is as follows: 5, 4, 3, 6, 2, 9, 5, 5, 4, 9, 3, 2, 8, 7, 5, 6, 4, 2, 7, 7, 5, 6, 5, 4, 7, 6,

Digitized by Google

8, 4, 4, 9, what was Paul's income from both his papers and eggs for the month?

9. What new items have you to add to your account book? On which side does each go? What is the latest balance?

10. Which had Paul better do now, pay his father a part or all that he owes him or buy some more hens, for he feels that he can take care of 24? Why do you think so?

11. How could you find out whether or not to buy them? Make a problem that would help to answer this question.

12. Solve the problem that you have made.

LESSON X.

1. Paul finds that he can buy 4 young Barred Rock hens from a woman on another street, and that she will let him pay her in work. She is asking $2.85 apiece for them. How much would they cost?

2. For the kind of work she wants him to do, he thinks his time is worth 28 cents an hour. (a) How many hours' work must he give to pay for these hens? (b) Express this answer in hours and minutes.

3. If Paul can only spare three-quarters of an hour a day, how many days will it take him to pay this debt?

4. Paul wants to buy 8 more hens. Look through the ad. sheet to find what you think would be the best "buys" for him.

5. Cut out the advertisements that you have selected and paste them on your arithmetic paper.

6. According to the prices that you have found, what will these eight hens cost?

Digitized by Google

7. What is the average price of the 12 hens just purchased?

8. Did these cost him more or less than the first twelve that he bought? How much more or less? What part is this of the cost?

9. Paul wants some little chickens. How much wire must he get to make the top and sides of a pen 6′ x 4′ and 2′ high, if the wire is 4 ft. wide?

10. How much will this wire cost at the present price?

11. He wants 2 x 4 lumber for the stakes at the four corners. How many running feet must he buy, if each stake is to extend into the ground ¾ of a foot?

12. If he puts a 4-inch strip around the bottom of the pen, how many running feet of lumber will this take?

13. How many running feet of a 2-inch strip will be required to go around the top of the pen?

14. If the 2 x 4 costs 5 cents a foot, the 4-inch 3 cents and the 2-inch 2 cents a foot, how much will the lumber cost?

15. Make out such a bill as he would be likely to receive if he had bought it from some lumber yard you know.

16. Supposing you were a collector for this lumber yard, how would you receipt this bill?

17. Make a sketch showing the kind of an opening you would have in this pen if you were Paul.

LESSON XI.

1. Paul's mother has offered to buy a fat hen that Paul does not care to keep. Which will be better for him, to sell it at 37¢ alive or 46¢ (a pound) dressed, if the

Digitized by Google

hen weighs 6½ lbs. alive and ⅞ lbs. is allowed for dressing?

2. Paul's class of seventeen members is to have a picnic. They have decided to have boiled ham to be fried with eggs, rolls, fruit, cake and toasted marshmallows. They want to share the expense equally. How shall they find out how much each is to pay?

3. If 1 lb. of ham will serve seven, how much must they order? What will it cost at the price of ham now?

4. They are counting on three rolls each. What will they cost?

5. If there are to be two eggs for each member of the class, how much must they allow for eggs?

6. How much will the fruit cost if they have one orange and one banana each, counting 4 bananas to the pound, and 4 pounds of apricots for all?

7. How many toasted marshmallows should be allowed for each? This will mean how many pounds altogether, counting 38 to the pound? What will be the cost of them?

8. Two of the girls will furnish cakes at cost. Here is the recipe to be used:

1 cup of sugar (½ lb.);
¼ lb. butter;
2 eggs;
½ cup of milk (1 cup = ½ pint);
1¼ lbs. flour;
baking powder 2¢; and
vanilla at 2¢.

How much will the cakes cost?

9. What will be the entire expense of the picnic?

10. How much should each pupil be asked to pay?

11. If Paul furnishes the eggs, will this be more or less

Digitized by Google

than his share? If you were the class treasurer, how should you settle with Paul?

12. If they decide to go to Long Beach by street car from Los Angeles for the picnic, how much will it cost to take the entire class and the teacher?

13. The fathers of two of the boys have offered their automobiles on two conditions: (1) they must furnish the gasoline, and (2) hire a third car. How much gasoline will be required if they can make sixteen miles to a gallon and they count ten extra miles each trip? How much is this gasoline worth?

14. A car will be furnished at 85 cents an hour. If the driver deducts two hours of the time, how much should be paid for this car if they plan to leave at 9:45 a. m. and return at 5:50 p. m.

15. What will be the total cost if the trip is made by automobile?

16. Which way had they better decide to go? Why?

17. If they decide to go by automobile, how can they make it fair to all? How much will this cost each?

LESSON XII.

1. Make a list of the things that if you were Paul you would like to have in your room.

2. Make a sketch of the room showing where you would place each article of furniture.

3. If you were allowed $75 for this furniture, make an itemized account showing how you would spend the money.

4. Cut from advertisements the pictures of each article that you would buy if you were not compelled to keep within the amount given. These pictures should always show cost.

Digitized by Google

5. What would be the total amount needed to furnish the room in this way?

6. If the firm from which you purchased this furniture allowed a discount of .08, for cash, what would be the cost?

7. If it were bought from Barker Bros., make a sales slip that could be used by the clerk making the sale.

8. Complete the sales slip by showing the discount given.

9. How much more money is needed to furnish the room as you would like to have it?

10. Find pictures of furniture showing cost of each article, that you must buy in order not to spend more than $75.

11. Make out a sales slip for this.

12. Make one or two problems showing how Paul could save some money by making a new or fixing up an old piece of furniture.

13. Solve the problem you have made.

14. Solve a problem made by some other member of your class.

LESSON XIII.

CARRYING PAPERS.

1. (a) The sworn average circulation of the Los Angeles Times for every day of February, 1922, was 122,564 copies. If the average number delivered by one carrier is 150, about how many carriers were needed for the Times in February? (b) How many papers were sold during the month? (c) There are fifty-four route managers for the Times. What is the average number of papers handled by each man? (d) If the carriers were evenly distributed in

Digitized by Google

these routes, each route man would have charge of how many boys?

2. (a) The Times pays the carrier 10 cents a week for serving a subscriber. How much would a boy earn if he had 150 subscribers? (b) How much could he earn in a year if he took no vacation? (c) This would average how much a month? (d) How much could a boy make who only had 125 subscribers? (e) One who had 185 subscribers could make how much in a year? (f) What would be his average monthly wage?

3. Boys who carry the Times are fined if there are too many complaints made against them. The money raised in this way is then distributed among the boys who have none or only a few complaints. (a) Find the sum of these fines: 50 cents, 75 cents, $1.25, 90 cents, $2.25, $1, $1.75, $1.40, 85 cents, $1.50, $2. (b) What would be a fair way of dividing this money among seven carriers with records as follows: Two with no complaints, two with one complaint each, two with two complaints each and one with three complaints? (c) Had this money been divided equally among these carriers, how much would each have received? (d) If fines are to be used, what do you think would be a fair amount? (e) Should boys be fined if there is only one complaint? How many complaints should you permit a carrier before you began fining him? (f) Name some reasons for customers missing their papers when carriers are in no ways to blame.

4. (a) In congested districts in the city the Times does not pay the carriers 10 cents for each subscriber. Can you see any reason for this? (b) Would it be fair to the other carriers who delivered the papers in the outlying districts? (c) Many times a boy will deliver to 300 regular subscribers in such a location and only

Digitized by Google

receive $21 a week. How much does he receive per hundred? (d) What is he allowed a week for a subscriber? (e) How much is he paid for a single paper?

5. Some of the boys buy their papers for 3 cents apiece. (a) A boy at one corner never makes less than $5 per day. What is the fewest number of papers that he sells? (b) A boy at another corner averages $8 per day. What are his average sales? (c) At another corner on Broadway one of the "newsies" often makes $12 per day. This means the sale of how many papers? (d) If the first one worked every day in the year except for two weeks, how much did he earn? (e) If the second one worked every day except the month of July, how much could he earn? (f) What would be the average wage a month for each of them?

6. (a) If one of these newsboys saves $1.75 each day, how much could he save in a week? (b) In a year? (c) If he loaned this amount for a year at 7%, how much interest would he receive?

7. (a) If a boy is saving his money for a year for a wireless radio set that costs $182, how much should he save a week? (b) How much a day? (c) If a boy saved 5 cents a day, how much would he have at the end of a year? (d) How many years would it take him to save $100 at this rate?

LESSON XIV.

1. The Examiner sells 250,000 papers in Los Angeles and vicinity. If the average number that one boy serves is 150, about how many carriers are needed for the paper?

2. (a) Each carrier buys his papers for 3 cents and sells them for 5 cents. How much does he make on each

Digitized by Google

paper? How much does he make a day if he carries 150 papers regularly? (b) How much can he earn in a week? (c) What were his earnings for the month of January? (d) February? (e) If he carries every day in April, how much can he earn?

3. One of the boys is saving his money to buy a bicycle which costs $60. (a) How many papers must he sell in order to earn this amount? (b) If he wants to earn that much money in one month, how many papers should he average per day? (c) If he decides to take two months for earning this amount, how many papers should he sell each day?

4. (a) If a boy wants his salary to be at least $80 a month, how much shall he earn each week? (b) How many papers will it be necessary for him to sell in order to earn this? (c) This would mean about how many papers a day?

5. (a) Which would be better for the carrier, to receive $15 a week for delivering 150 papers or that he buy them as the Examiner asks him to do? How much better is it? (b) How many papers would he need to sell each day if he wanted to earn $15 a week? (c) What per cent does he gain by buying his papers? (d) Are there any other advantages for him in this plan of letting him buy his papers? (e) What are the advantages in this plan for the managers of the Examiner?

6. (a) If the Examiner paid $15 a thousand for selling their papers, how much would it cost them per hundred? (b) How much would this be per paper? (c) At this rate what would a boy receive who sold 125 papers? (d) One who sold 86 papers? (e) One who sold 138 papers would receive how much? (f) At the rate the boys buy the paper, what part of the price of the paper

Digitized by Google

do they get for their work? What part does the Examiner receive? (g) Each of these is what per cent?

7. If there are no complaints against the carrier, he receives a $2-a-month bonus from the paper. (a) What is a "bonus"? (b) Which is better, this plan or deducting from a boy's earnings when there are complaints? Why do you think so? (c) This bonus would be equivalent to selling how many extra papers? (d) How much could a boy earn if he gave perfect service to his 147 customers each day for the month of August?

8. (a) If a boy starts after his papers at 4:35 a. m. Monday and reaches his home again at 7:10 a. m., how long did that morning's service take him? (b) If he delivered 150 papers in this time, how much were his services worth per hour? (c) If on Tuesday he is gone from 4:50 a. m. until 6:30 a. m., how long did it take him that morning? (d) At what rate per hour was he paid on Tuesday?

9. (a) Wednesday his time was 5:10 a. m. until 7:35 a. m. How long did it take him? (b) On Thursday he left at 4:55 a. m. and returned at 7:14 a. m. How much time did he use? (c) On Friday he was gone from 4:48 a. m. until 6:33 a. m. This is how long? (d) Saturday it took him from 5:02 a. m. until 7:23 a. m. Find the time. (e) Sunday he left at 5:10 a. m. and returned at 7:05. How long was this? (f) What is the daily average for that week?

LESSON XV.

1. (a) Do you think that the people who work in stores need to know arithmetic? (b) Name as many

Digitized by Google

processes as you can that some or all will be expected to know.

2. In making a study of Bullock's, one of the big department stores in Los Angeles, the employes were divided into two groups, selling and non-selling. (a) Name the two classes that belong to the selling group. (b) What kind of work is done by the non-selling group? (c) Name some of these.

3. (a) What kinds of problems do the salespeople have? (b) What kind will the buyers have that is different from those of the salespeople?

4. (a) The people of the non-selling group who work in the receiving room would need a knowledge of which parts of arithmetic? (b) What would be required of the main office force? (c) How will the bookkeepers' work differ from that of other members of the non-selling group? (d) What will be necessary for the timekeeper to know?

5. (a) How is it possible for him to check the time for two thousand employes? (b) Do the delivery men have any number work at all to do? If so, what is it? (c) What is the work of the paymaster? (d) What does he need to know?

6. (a) Most of the problems of the salespeople are of this type: unit times number. Can you give the meaning of the above sentence in another way? (b) A clerk in the cotton goods department made these sales: Six yards of cotton crepe @ 35¢ a yard; 5½ yards of gingham @ 65¢; 6½ yards of dimity @ 45¢; 3¾ yards of gingham @ 60¢; 8 yards of crepe @ 19¢; 9½ yards of percale @ 25¢. Make a sales slip such as this clerk might give. (c) How much does this customer owe? (d) What change should she receive from a $20 bill?

7. A clerk in the notions department sold these articles

Digitized by Google

to one customer: Eight spools of thread @ 6¢; 6 cards of hooks and eyes @ 2 for 15¢; 1 package of needles @ 25¢; 2 papers of pins for 25¢; 1 package of hairpins @ 20¢; 2 packages of hairpins @ 15¢; 3 packages of hairpins for 10¢; 4 hair nets @ 2 for 25¢; 3 yards of belting @ 19¢; 4 cards of "snaps" @ 8¢. (a) Make a sales slip for these articles. (b) How much does the customer owe? (c) How much change should be given if the customer pays with a 10-dollar bill?

8. In the ribbon department these sales were made: 4½ yards of ribbon @ 30¢; 1¾ yards of ribbon @ 65¢; 2⅓ yards of ribbon @ 75¢; 6 inches of ribbon @ $4.50 per yard; 3⅛ yards of ribbon @ $1.25 a yard; 3 inches of ribbon @ $3.60 per yard; 7½ yards of ribbon @ 25¢; 2¼ yards of ribbon @ 35¢; 4⅔ yards of ribbon @ 90¢; (a) Make a sales slip. (b) How much does the customer owe? (c) What change should be given for four five-dollar bills?

9. Some of the silk sales were as follows: 6½ yards @ $2.85; 4¾ yards @ $2.70; 3⅓ yards @ $3.25; 1¾ yards @ $4.20; 7¼ yards of silk tubing @ $2.10; ½ yard @ $3.45; ⅔ yard @ $5; 9 yards @ 75¢; 4 inches @ $8.25 a yard; 2¾ yards @ $1.35; 6 inches @ $5.40; a yard; 9 inches @ $6 a yard. (a) Make a sales slip for these. (b) What is the total amount of the sales? (c) These pieces were bought by Mary K. Brown, a milliner, and she gave a check drawn on the Merchants National Bank, Los Angeles, for the amount. Write a check that you could give in payment if you were Mary K. Brown.

Digitized by Google

LESSON XVI.

1. (a) What kinds of problems does the paymaster have? (b) Which parts of arithmetic must he know?

2. (a) If a person has worked full time each day and he is paid by the week, is there any problem in computing his salary? (b) If he has only worked part of the time on one or more days, and he is paid by the week, what must one do to find the amount of salary due him?

3. (a) How much does the store owe a clerk who has worked 4¾ days if his salary is $16.20 a week? (b) What would be due him for the same length of time at $18 a week? (c) At $21 a week?

4. (a) What is due an employe for 5½ days at the rate of $18 per week? (b) At the rate of $22 a week? (c) At $26 a week?

5. (a) Find the amount due an employe for 3⅞ days at a salary of $19 a week. (b) For 5⅜ days at $25 per week. (c) For 5¾ days at $23 per week.

6. (a) A clerk worked 6½ hours on Wednesday, 7¾ hours on Thursday, 5¼ hours on Friday, 4 hours on Saturday (store closes at 1 p. m.), 8 hours on Monday, 7¼ hours on Tuesday. How many hours did he work? (b) How many days? (c) How much does the store owe him if his regular salary is $21 a week.

7. (a) An employe worked 7⅛ hours on Wednesday, 6¾ hours Thursday, 5½ hours Friday, 4 hours Saturday, 6⅞ hours Monday, and 4¾ hours Tuesday. Find the number of hours for the week. (b) This is equivalent to how many days? (c) What does the store owe him if his salary is $19.50 per week?

8. (a) The clerks in some of the departments, such as

Digitized by Google

ready-to-wear clothing and shoes, earn a bonus in addition to their regular salary. What must the paymaster know before he can figure the bonus for such clerks? (b) Can you see any reason for giving it in these departments when it is not given in all?

9. (a) A clerk whose sales were $459.50 received a bonus of 1½% in addition to his $18.50 salary. What was his bonus? (b) How much did the store pay him at the end of the week if he worked full time?

10. (a) A clerk whose sales amounted to $378.95 received a bonus of 2¾%. How much did he receive as a bonus? (b) If his salary were $17.75 and he worked 5½ days, how much is due him at the end of the week?

11. (a) A clerk sold $59.75 worth of goods Wednesday, $97.68 Thursday, $112.35 Friday, $54.63 Saturday, $127.72 Monday, $49.87 Tuesday. What was the amount of his sales for the week? (b) If he received a bonus of 1¾%, how much extra pay did he receive? (c) If his salary is $22.50 per week and he worked 5¾ days, how much should he receive for the week?

12. (a) A clerk's sales for Wednesday were $79.63; Thursday $89.98; Friday, $64.76; Saturday, $58.87; Monday, $146.92; Tuesday, $104.15. What was the sum of his sales for the week? (b) What bonus did he receive if he were paid at the rate of 3½%? (c) If his salary is $18.75 per week and he worked 4¼ days, how much should he receive for the week? (d) At this rate (including bonus), how much does he earn per hour?

LESSON XVII.

Some of the office employes at Bullock's need to know how to figure discount.

1. (a) When do you pay for things that you buy? (b) Do you buy in small lots or big lots? (c) Do you buy what

Digitized by Google

you or your family can use or so that you can sell a part or all to some one else? (d) How does a store buy? For what purpose does it buy? (e) When a store pays its bills within a certain time, it usually is not asked to pay as much as the bill calls for. The money it saves in this way is called discount. Sometimes people get a discount on what they buy. Have you ever bought anything upon which you were given a discount?

2. (a) The store received a bill of $510 for goods purchased, and it was allowed a discount of 3%. How much money did it save? (b) How much money did the store send in payment for the goods? (c) The store bought $450 worth of hosiery. For how much was the bill made? (d) A discount of 4% was given them for paying the bill immediately. How much could they save in this way? (e) How much should they send in payment of the goods?

3. (a) A store buys its goods at wholesale. How does it usually sell the goods? (b) In buying its stock, a firm is usually given a discount if the bills are paid within ten days from the time of shipping them. Where do the stores in the West buy much of their stock? (c) Can you see any reason why this ten-day discount might not interest some of these stores? (d) An offer of a 2% discount for ten days is written 2–10. What does a 3–10 mean?

4. Find a 2–10 discount on these bills:
   (a) $750 for cotton yardage.
   (b) $1,125 for silk yardage.
   (c) $148 for ribbon.
   (d) $735 for gloves.
   (e) $416.50 for shoes.
   (f) Find the amount of money that is necessary to pay each bill.

5. Find a 4–10 discount on these bills:

Digitized by Google

(a) $163.75 for millinery.
(b) $117.85 for ties.
(c) $354 for underwear.
(d) $62.95 for aprons.
(e) $528.38 for shirts.
(f) What amount of money is necessary to settle each of the above bills?

6. Very often a discount of 8% is given on the goods purchased for the ready-to-wear department. Find such a discount on each of these shipments:

(a) 4 dozen children's dresses at $7.95 each.
(b) 6 dozen misses' coats at $19.42 each.
(c) ½ dozen evening gowns at $54.65 each.
(d) 3 dozen suits at $27.65 each.
(e) 2 dozen ladies' coats at $18.68 each.
(f) A shipment of dresses, $107.25.
(g) A shipment of skirts, $96.14.
(h) How much money will be required to pay each of the above bills? (i) What is the total amount of money necessary to settle for all of these?

7. The discount that is liked best by the stores in the West is an R. O. G. discount which means 10 days after the goods are received. Find a 3 R. O. G. on each of these bills:

(a) $278.32 for shoes.
(b) $117.29 for hosiery.
(c) $38.54 for collars.
(d) $131.15 for robes.
(e) $26.75 for children's waists.
(f) $109.84 for coveralls.
(g) Find the amount that will pay each one of the above bills. (h) How much money will it take to pay all at one time?

Digitized by Google

LESSON XVIII.

1. The department stores are no longer compelled to ask the customers to pay war tax except on jewelry. (a) To whom do the stores pay this war tax? (b) For what is it used? (c) How is it figured? (d) How do you explain the fact that Congress removed it from other articles and left it on jewelry?

2. (a) The war tax on jewelry is always 5%. What is the tax on a watch priced at $55? (b) How much does it cost the customer? (c) The clerk tells the customer that a string of beads is $4.25. What is the war tax on them? (d) How much must the customer pay for the beads?

3. (a) A silver belt buckle is priced at $3.75. How much is the war tax on this buckle? (b) What does the customer pay for it? (c) A pin is marked $10.65. How much will the war tax be? (d) What is the actual price to the customer?

4. (a) The school pins are listed as follows: Gold filled, 55 cents each; solid gold, $1.25 each. What is the war tax on each kind? (b) How much must the students pay for each? (c) If a class of 25 orders, 9 of the gold filled and the remainder of solid gold, what will be the entire cost to the class?

5. Mary and Blanche had saved their money to buy a watch charm for their father's birthday. They found several they liked which were priced as follows: (a) $3.95. (b) $4.15. (c) $4.60. (d) $3.45. (e) $5.35. (f) $4.45. What is the war tax on each? (g) Find the cost of each, including the war tax.

6. (a) Find the amount of war tax on each of these

Digitized by Google

rings: (a) $7.25. (b) $8.65. (c) $12.40. (d) $9.35. (e) $10.25. (f) $11.95. (g) Find the cost of each, including the tax.

7. (a) Do people pay a war tax upon anything else that they buy? (b) What is the rate of tax upon theater tickets? (c) Do people always know that they are paying a tax on these? (d) How do some of the theaters manage to make it appear that they are not charging war tax?

8. (a) At the Hillstreet Theater the prices quoted for matinees are 25¢ and 36¢, plus tax. What is the tax on each? (b) What is the cost of these tickets? (c) The prices for nights and Saturday matinees are 36¢ and 50¢. Find the cost of the seats.

9. The prices at the Mason are: (a) 50¢; (b) 75¢; (c) $1.25; (d) $1.50; (e) $2; (f) $2.50; (g) $3. Find the cost of each, including the war tax.

10. The prices quoted by the Philharmonic for the performance of the Chicago Opera Company are:

Entire orchestra	$ 7.50
Balcony, first six rows, center	6.00
Balance of balcony	5.00
Mezzanine box, first row	5.00
Balance of mezzanine boxes	4.00
Mezzanine floor, first two rows, center	5.00
Balance of mezzanine floor	4.00
Second balcony seats	3.00
Gallery seats	3.00
Boxes and loge seats	12.00

(a) Make a table of the above showing war tax and total cost of seats. (b) What is the least amount of money required to take a family of four to one performance? (c) How much would it cost this family of four if they sat

Digitized by Google

down stairs? (d) How many pupils in your class really care for music? (e) How much would it cost to take them to one performance if they sat in the balcony? (f) What are some arguments in favor of high prices for musical entertainments? (g) What are some against it?

LESSON XIX.

HOW THE TIME FOR THE WORKERS IS KEPT.

Bullock's have heavy pasteboard cards that measure 7″ by 4″. On one side in large letters is printed, "This side out." On this same side is a space for the name, address, city and telephone. One of these is made for each week, so at the top is stamped the date of the first day of their working week. On the other side are spaces where the employe by running it through the time clock can record the time when he begins work, when he leaves and, also, the time when he goes out and returns if he takes any time off during the day.

Digitized by Google

JULY 26, 1921

THIS SIDE OUT

Name_____

Address_____

City_____ Phone_____

Digitized by Google

JULY 26, 1921

	Wed.	Thu.	Fri.	Sat.	Sun.	Mon.	Tue.	
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								Weekly Totals
Total								

870

Digitized by Google

1. (a) The week at Bullock's begins on which day? Ends which day? (b) What is a good reason for not having the work week begin on Monday?

2. (a) If Miss J's card is stamped at 8:30 a. m. and 5:00 p. m. for Wednesday, how many hours did she work? (b) How long did she have off at noon? (c) How many hours constitutes a working day under the California State law? (d) What should be written in the space which gives total for Wednesday? (e) In the Thursday space the card is stamped at 10:30 and again at 5:30. What is the total number of hours for Thursday? (f) Friday the time given is 9:00 and 5:30. How many hours did she work? (g) On Saturday she reported for work at 9 o'clock. The store always closes at 1 p. m. Saturday, but the employes are paid for full time. What would be regarded as the total number of hours for Saturday? (h) For Monday the card is stamped at 8:40 and 4:10. How many hours is this? (i) On Tuesday her card shows that she began work at 9 o'clock and checked out at 5 p. m. How many hours did she work? (j) What is the total number of hours for the week? (k) How many days is this?

3. (a) Time on another card: Wednesday, 9:10 and 5:10; Thursday, 9:00 and 5:30; Friday, 8:45 and 5:00; Saturday, 8:45 and 12:45; Monday, 9:00 and 5:30; Tuesday, 9:15 and 4:00. (a) Find total hours for each day. (b) How many hours for the week's work? (c) How many days?

4. Another card was stamped as follows: Wednesday, 9:15, 12:30 out, 1:45 in, and 5:30; Thursday, 8:55 and 5:25; Friday, 9:15 and 4:15; Saturday, 9:00 and 1:00; Monday, 8:50, 3:50; Tuesday, 9:05, 5:05. (a) Find the total number of hours for each day. (b) What is the total

Digitized by Google

number of hours for the week? (c) Find the number of days.

5. One card recorded these hours: Wednesday, 8:35 and 5:05; Thursday, 8:55 and 5:25; Friday, 8:50, 10:30 out, 12:10 in and 5:30; Saturday, 9:00 and 1:00; Monday, 9:40 and 5:10; Tuesday, 8:50 and 2:20. (a) What is the total number of hours for each day? (b) For the week? (c) How many hours for the week?

6. Make out a table showing at what time the 8-hour day is finished if 30 minutes for lunch is allowed and the beginning time is as follows: (a) 8:30. (b) 9:15. (c) 8:45. (d) 9:05. (e) 8:35. (f) 9:10. (g) 8:40. (h) 9:20. (i) 8:50. (j) 9:25. (k) 8:55. (l) 9:30. (m) 9:00. (n) How many and which ones of these could not get in a full day if the store closed at 5:30? (o) Do you suppose the time-keeper has his table made out? How would this help?

LESSON XX.

1. The large stores always know how much an employe costs the store. This is found by dividing his weekly salary by the net amount of his sales. (a) Explain net amount of his sales. (b) In such problems will the quotient be a whole number or a fraction? (c) Should it be written as a common or as a decimal fraction?

2. (a) The net amount of Miss B's sales is $287.45. Her salary is $16.00 per week? How much does she cost the store? (b) Miss R's net sales are $426.95 and her salary is $18.50. What is her cost to the store? (c) Miss D's net sales are $569.38 and her salary is $21 per week. Find her cost to the store. (Find quotients to four decimal places.)

Digitized by Google

3. (a) Miss K's net sales amounted to $827.36 and her salary is $22.50. How much does she cost the store? (b) Miss R's net sales were $312.64. If her salary is $18.75, what is her percentage of cost to the store? (c) Miss M's salary is $23.75 and her net sales are $621.79. What is her percentage of cost as an employe?

4. (a) Miss A's net sales were $629.46. Her weekly salary is $18.00, and she receives a bonus of 1½%. What is her cost to the store? (b) Miss Z's net sales are $524.15. Her weekly salary is $17 and her bonus is 1¼%. How much does she cost the store? (c) Miss N's salary is $21 and the rate of her bonus is 2½%. Her net sales are $947.63. What is her percentage of cost to the store?

5. (a) Miss T's net sales were $265.14. Her salary is $16 per week, and she receives a bonus of 1¼%. What is her cost as an employe? (b) Miss H's net sales amounted to $723.15. Her salary is $21 per week, and her bonus is 1¾%. Find the actual cost. (c) Miss G's sales netted $516.78. Her weekly salary is $22 and her bonus is 1¼%. How much does she cost as an employe?

6. The clerks are ranked according to their producing power. (a) Which should be given rank 1, the one who costs the store the least or the most? (b) Make a table, putting in the clerk's name, her net sales, salary, bonus, her cost to the store, and her rank. (Arrange these according to rank.)

7. The store feels that an employe should not cost more than 5%. Find how much the store could afford to pay per week for these average net sales: (a) $269.35, (b) $612.42, (c) $487.25, (d) $529.68, (e) $716.29, (f) $327.98, (g) $402.19, (h) $436.78.

8. (a) What is the average of the percentages of cost that you have found in the above problems? (b) How

Digitized by Google

much more or less is it than 5%? (c) Is it too high or too low?

9. Miss Jordan's sales for Wednesday were $79.63; Thursday, $85.62; Friday, $49.95; Saturday, $57.86; Monday, $89.47; Tuesday, $63.27. On Saturday she had $14.93 worth of merchandise returned which was charged against her. (a) What was the sum of her gross sales? (b) The amount of her net sales? (c) If her salary is $19 and she receives a bonus of 2¼%, how much does she cost the store?

10. Miss King's sales for Wednesday were $52.16; Thursday, $69.83; Friday, $48.96; Saturday, $71.68; Monday, $87.94; Tuesday, $43.87. This returned merchandise was charged to her: Monday, $24.75; Friday, $9.15; Saturday, $7.65. (a) What are her gross sales? (b) What are her net sales? (c) If her salary is $18 and her bonus 1¾%, how much does she cost the store? (d) If these sales were regarded as average, how much could the store afford to pay her? Find the average of columns 3, 4, 5, 6, 7, 8, 9 and 10.

LESSON XXI.

1. No firm nor employer can afford to keep an employe who does not "produce" enough business to pay for letting him have a part in it. (a) How does a clerk "produce" business? (b) How does an advertising man "produce" business? (c) How can a farmer determine whether or not his helpers are paying for themselves? (d) Would it be more or less difficult to determine this fact about a laundry helper?

2. (a) How is it possible to tell whether or not a clerk "produces" sufficient business? (b) Should a clerk do more for the business than to sell just enough to pay his

Digitized by Google

salary? When an employe does his part, business people say he has earned his "quota." (c) Look in the dictionary for the meaning of the word "quota." (d) How does a boy who sells papers make his quota?

3. (a) The quota of a clerk is determined by finding his salary per cent. What two things must you know in order to find this per cent? (b) Should the clerk receive credit for goods that he has sold which the purchaser has returned? State your reasons. (c) Should this kind of business be encouraged? (d) Give arguments for both sides of the question.

4. (a) A clerk in the silk yardage department has a weekly salary of $16.50. The salary per cent in this department is 5%. What should her net sales average a week? (b) How much should she sell in a year? (c) If the salary is $21.50 a week, what should the average net sales be? (d) The net sales for a year?

5. (a) The salary per cent for the wool yardage is 6%. What should the net sales average per week if the salary is $18.60? (b) Find the average net sales for a year. (c) If the salary is $21 per week, find the average net sales for the week. (d) The average net sales for the year.

6. The salary per cent for the sales people in the lace department is 7%. (a) Find the average net sales when the salary is $19.60 per week. (b) Find the average net sales for the year. (c) Find the weekly net sales if the salary is $18.20 per week. (d) Find the average net sales for the month of August if the first day is Tuesday.

7. The salary per cent of the ready-to-wear department is 4%. (a) Find the average net sales for a week if the weekly salary is $19.50 and the bonus amounts to $7.70. (b) For a weekly salary of $21.20 and a bonus of $11.50. (c) For a weekly salary of $16.50 and a bonus of $8.16.

Digitized by Google

8. The salary per cent of the millinery department is 7%. (a) Find the weekly net sales if the daily pay is $3.50. (b) If the daily pay is $4.20. (c) If the daily pay averages $2.68⅓. (d) If the daily average pay is $3.73⅓.

9. The salary per cent expected in the toilet goods department is 6%. (a) Find the average net sales for the week if the salary is $17.40. (b) Find the yearly net sales. (c) What are the average gross sales for the above clerk who has a charge of $94.85 of returned goods against her? (d) Find the weekly net sales if the salary is $22.80. (e) Find the yearly net sales. (f) Find the yearly gross sales if the clerk is charged with $87.94 returned merchandise.

LESSON XXII.

1. Make a table with these headings: Name, number, number of actual sales (abbreviate), gross sales, returns, net sales, days present, daily salary, salary for week, per cent of salary, rank. (a) How many spaces shall you need? (b) About how wide should the space be? (c) About how long should you make the table? Make the table wide enough to put in this information concerning the following people. (d) About how wide should the table be? (e) Use your ruler to draw straight lines, and write or print headings neatly.

2. Mabel Sands; number 387; actual sales, 73; gross sales, $395.84; returns, $29.16; net sales.....; days present, 6; daily salary, $2.75; salary for week.....; per cent of salary.....; rank.....

3. Jeannette Bixby; number 416; actual sales, 54; gross sales, $412.05; returns, $16.38; net sales.....; days present, 5½; daily salary, $3.15; salary for week.....; per cent of salary.....; rank.....

Digitized by Google

4. Alice Bank; number 305; actual sales, 67; gross sales, $361.72; returns, $9.89; net sales.....; days present, 4⅞; daily salary, $2.95; salary for week.....; per cent of salary.....; rank.....

5. Eunice George; number 389; actual sales, 94; gross sales.....; returns, $13.82; net sales, $316.43; days present, 5; daily salary, $3.35; salary for week.....; per cent of salary.....; rank.....

6. Blanche Mabin; number 373; actual sales, 76; gross sales, $411.22; returns.....; net sales, $389.74; days present, 5¾; daily salary, $3.75; salary for week.....; per cent of salary.....; rank.....

7. Dorothy Jordan; number 302; actual sales, 92; gross sales.....; returns, $6.17; net sales, $426.35; days present, 6; daily salary.....; salary for week, $25.20; per cent of salary.....; rank.

8. Frances Burns; number 399; actual sales, 86; gross sales, $402.01; returns, $17.84; net sales.....; days present, 5¼; daily salary, $3.25; salary for week.....; per cent of salary.....; rank.....

9. Florence Jackman; number 301; actual sales, 91; gross sales.....; returns, 0; net sales, $411.29; days present, 5⅜; daily salary, $3.40; salary for week.....; per cent of salary.....; rank.....

10. Ruth Wagner; number 396; actual sales, 74; gross sales, $411.19; returns, $13.78; net sales.....; days present 4⅝; daily salary, $4.20; salary for week.....; per cent of salary.....; rank.....

11. Above this table write or print:

Week of August 1–7, 1922.

12. (a) Find the average number of actual sales made by these people. (b) The average amount of the gross sales.

Digitized by Google

(c) The average amount of the returns. (d) The average amount of the net sales.

13. (a) Find the average number of days present. (b) The average daily salary. (c) The average salary for the week. (d) The average per cent of salary.

LESSON XXIII.

STUDY OF INDUSTRY—SELECTING A FARM BUSINESS.

This selection is determined by the answers to these two questions, viz: "How much money has a man to invest?" and "What kind of work does he like best to do?"

A man thinking of going into any business must first determine about how much money he will need at the beginning. If it is the poultry business, he will figure in this way.

1. (a) What is the price of land north of the city? East of the city? South of the city? West of the city? (b) Which one of these locations does he really prefer? Why? (c) How many acres will be best for him?

2. (a) If he decides on 8 acres, and the land is worth $325 per acre, what will the land alone cost him? (b) Two acres are to be reserved for the house and other buildings, lawn, garden, fruit trees, etc. How many acres will be used entirely for the chickens? (c) How many 1½-acre fields can he make out of this?

3. (a) How many square rods in an acre? In 1½ acres? In 8 acres? (b) If the ranch were 40 rods long, how wide would it need to be? (c) Draw it to scale, stating the scale you have used.

4. Make a rough sketch (not to scale) showing the location of these: (a) Space reserved for house and garden; (b) the road; (c) the four 1½-acre fields.

Digitized by Google

5. (a) If the piece reserved for the house runs all the way across the front of the ranch (32 rods), how wide must it be to contain 2 acres? (b) How many feet in 32 rods? (c) About how many lot frontages would that make in an average city block? (d) Is that too wide a frontage?

6. (a) If 10 rods of the length of the ranch are used for the yard and garden, how many rods remain for the chickens? What is its width? (b) If this space is divided into four equal fields, what will be the dimensions of each? (c) What is the length and the width in feet? (d) Show these divisions by drawing a diagram to scale.

7. (a) How many rods of fence will it take to fence these four fields? (b) If fencing costs $1.65 per rod, how much money must be allowed for the fence?

8. (a) A horse, wagon and harness will be needed. If the horse costs $165, the harness $25 and the wagon $60, what will be the cost of the three? (b) The well and pumping plant are listed at $350, and the estimated cost of piping the water $200. How much will this part of the equipment cost?

9. In stocking this poultry ranch, it would be wise to buy 1,000 three-month pullets @ $1.50, and 2,000 day-old chicks @ 8¢ each. (a) What would be the cost of the pullets? (b) The chicks? (c) What is the total cost of the stock?

10. (a) Make a table showing the number of things for which money has been paid out and the cost of each thing. (b) What is the cost of all of them?

Digitized by Google

LESSON XXIV.

1. Other necessities are: Feed cutters and mixers, $150; brooder house, $900; corn, $600; two fowl houses, $950 each; plow, cultivator, harrow, $72; incidentals, such as litter carriers, feed and nest boxes, $300. (a) List these things and show the cost of each. (b) What is the cost of all of them? (c) What is the total investment? (This does not include dwelling house.)

2. (a) If they figure that ⅓ of the chicks are likely to die, and that ⅓ will be roosters, how many chicks should they buy in order to have 1,000 laying hens? (b) In running a 2,000-hen plant when ½ stock is replaced annually, how many chicks would they plan on buying each year?

3. To determine operating expenses for first year. (a) What does "operating" mean? (b) If extra labor is needed for half of the time, for how many days would an extra man be employed? There are how many weeks in the year? How many days per week would he work? (c) If his services are worth $3.75 per day, how much will the extra labor cost?

4. (a) It is estimated that the little chickens can be fed at an average cost of ¼ cent per day. How much will it cost to feed 2,000 for a day? (b) What is the cost of feeding this number for a month? (c) For a year? (d) If the food for a 3-month-old pullet costs ¾ cent per day, how much will it cost to feed 1,000 for a day? (e) For a month? (f) For a year? (g) If $40 extra is allowed for green crops, what is the total cost of feed for a year?

5. (a) If the expenses of the family average $2.50 per day, how much must be allowed for a month? (b) For

Digitized by Google

a year? (c) If the total expense of the horse averages 95 cents a day, what is its cost for a month? (d) For a year?

6. (a) If the buildings, chickens and supplies are valued at $12,000 and they are insured for ¾ of that amount, what is the insured valuation? (b) The insurance costs 60 cents for $100 for 3 years. How much did the insurance cost for the three years? (c) How much would that average for a year?

7. (a) What is ⅔ of the valuation of this property? (b) If the total tax rate is $2.03 for $100 and it is figured on the valuation given in (a), what are the taxes for a year?

8. (a) List the items with the amount of each in the operating expenses for the first year. (b) What is the total amount?

9. This expense may be divided into 4 periods as follows:

January–March, $\frac{3}{10}$ of the total cost.
April–June, ...of the total cost.
July–September, ¼ of the total cost.
October–December, $\frac{6}{25}$ of the total cost.

(a) What was the expense from January to March? (b) From July to September? (c) From October to December? (d) How can you find the expense from April to June? (e) What is this expense?

10. Finding the capital required. (a) What does "capital" mean? Many cockerels and eggs will be sold, so it is not necessary to have the whole amount in cash. There will be received from sales:

January to March, nothing.
April to June, $400 a month.
July to September, $800 a month.

Digitized by Google

October to December, $1,000 a month.

Find the amounts received from sales in each period.

11. (a) What is the amount of the original investment? (b) If $1,200 is allowed for a house and $1,620 for running expenses, what is the total capital needed?

LESSON XXV.

This shows the bearing acreage of the leading tree crops in California in 1919 and the total value of the product. (The following table was supplied by the U. S. D. A. Bureau of Crop Estimates.)

Kinds—	Approximate Acreage of bearing trees.	Production.	Value.	Rank.
Almonds	34,972	6,615 tons	$ 2,998,600	. . .
Apples	43,647	4,300,000 boxes	12,568,000	. . .
Apricots	40,686	167,800 tons	13,564,000	. . .
Citrus Fruits .	143,214	21,102,000 boxes	57,192,000	. . .
Peaches	107,575	440,000 tons	25,901,000	. . .
Plums and Prunes	120,110	173,520 tons	33,919,200	. . .
Walnuts	48,520	26,500 tons	14,840,000	. . .

1. (a) Which one of these fruits ranked first in value? Second? Third? (b) In the column marked "Rank," place the rank of each fruit.

2. (a) How much was a ton of almonds worth in 1919? (b) A ton equals how many pounds? What was the price per pound? (c) An acre produced how many pounds?

3. (a) What was the price of a box of apples? (b) How many boxes were produced on one acre?

4. (a) What was a ton of apricots worth? (b) What

Digitized by Google

was the price per pound? (c) One acre produced how many pounds?

5. (a) How much was a box of citrus fruits worth? (b) How many boxes were produced on one acre?

6. (a) What was the value of one ton of peaches? (b) What was the price per pound? (c) How many tons were produced to an acre?

7. (a) What was the price per ton of plums and prunes? (b) Per pound? (c) How many pounds are produced per acre?

8. (a) What was the value of a ton of walnuts? (b) What was the price per pound? (c) How many pounds were produced per acre? (d) This is what part of a ton?

9. (a) Which one of these fruits should you prefer to raise? (b) What are the reasons of your choice?

Fruit trees—	Acres bearing.	Acres not bearing.	Total acres.	Percent not bearing.	Rank.
Almonds	26,333	24,164	.....	.....	...
Apples	41,584	36,118	.....	.....	...
Apricots	39,599	22,637	.....	.....	...
Citrus	136,472	64,557	.....	.....	...
Peaches	106,068	17,621	.....	.....	...
Plums and Prunes	108,665	39,113	.....	.....	...
Walnuts	45,567	22,277	.....	.....	...

10. (a) Find the total number of acres of each fruit. (b) Place each answer where it should be in the "Total Acres" column.

11. (a) How many acres are planted with almond trees? (b) Write the fraction that shows what part has non-bearing trees. (c) What per cent is this? (d) Find the per cents for the other kinds of fruits in the same way.

Digitized by Google

12. According to these per cents find the rank of each kind of fruit.

13. (a) How many acres are planted with bearing fruit trees? (b) With non-bearing trees? (c) What is the total number of acres planted with fruit trees?

LESSON XXVI.

In starting a walnut orchard the owner must have a good idea of how much capital is needed.

1. What is meant by "capital"?

These prices are considered fair:

Land, per acre, unplanted:

Best	$1,500.00
Good	800.00
Fair	350.00

2. (a) How many dollars less per acre is the "fair" land than "good"? (b) The "fair" land is what fractional part of the "good" land? (c) What per cent is it? (d) The "best" land is what fractional part of the "good" land? (e) What per cent is it?

Land, per acre, bearing (water right included):

Best	$2,000.00
Good	1,200.00
Fair	800.00

3. (a) The fair land that is bearing is how many times as much as the fair land that is unplanted? (b) The good land that is bearing is how many times as much as the good land unplanted? (c) The best, bearing, is how many times as much as the best, unplanted?

4. (a) The fair, unplanted, is what part of the fair, bear-

Digitized by Google

ing? What per cent? (b) The good, unplanted, is what part of the good, bearing? What per cent? (c) The best, unplanted, is what part of the best, bearing? What per cent?

5. Cost per acre of establishing an orchard:

Preparation of land	$50.00
Clearing, grading, leveling	
Plowing and working down	9.00
Planting	
Trees	30.00
Setting	4.00
Replanting (including trees)	3.00

(a) What is the total cost per acre? (b) What is the cost of preparing the land? (c) What is the cost of planting? (d) What part of the whole cost is the preparation of the land? What per cent? (e) What part of the whole cost is the planting? What per cent? (f) What would be the cost of establishing a 15-acre orchard?

6. Costs from setting out to self-sustaining age. (a) What does "self-sustaining" mean?

Annually, per acre:

Plowing and cultivating	$14.00
Irrigating (water and labor)	14.00
Pruning	3.50
Whitewashing	1.50
Cover crop (when grown)	7.50
Taxes and insurance	4.50

(b) How much does it cost to take care of one acre of walnuts for a year? It takes six to ten years for walnut trees to give an income. (c) How much would it cost to care for an acre for six years? For nine years? (d) How much would it cost to care for 15 acres for eight years?

Digitized by Google

(e) The cost of caring for an acre is what part of the cost of establishing an acre? What per cent?

7. Costs of mature orchard. (a) What does "mature" mean?

Annually, per acre:

Plowing and cultivating	$14.00
Irrigating (water and labor)	16.00
Fertilizer (if used)	35.00
Pruning	5.00
Taxes and insurance—	
Best orchards	11.00
Good orchards	6.50
Fair orchards	3.25

(b) How much does it cost to take care of an acre of good orchard (mature) for a year? (c) An acre of the best orchard? (d) An acre of a fair orchard? (e) The cost of taking care of an acre is what part of the cost of establishing one? What per cent?

8. Cost of harvesting and marketing:

Picking, per ton	$25.00
Hauling, per ton (5 miles)	1.50
Processing, drying and selling, per ton	30.00

(a) How much do they pay a pound for picking? (b) What is charged per pound for hauling? (c) If an acre yields 1,000 pounds, what is the total cost of harvesting and marketing per acre? (d) If an acre yields 1,500 pounds, what is the total cost? (e) The harvesting and marketing is what part of the cost of establishing an orchard? What per cent? (f) Find the total cost (approximate) from the time the land is purchased until the orchard becomes self-sustaining. (Make your own selection of land, the number

Digitized by Google

of acres you will buy, and decide how many years it will take for your orchard to become self-sustaining.)

LESSON XXVII.

INCOME FROM BEARING ORCHARDS.

Item—	Safe estimate for business purposes.	Income which competent man may hope to obtain.	Income frequently obtained under favorable conditions.
Yield per acre.....	1,000 lbs.	1,500 lbs.	2,000 lbs.
Valuation per acre...	$1,100	$1,500	$1,800
Gross income	....	....	....
Annual cost of operation (per acre)....	....	....	....
Cost of packing and marketing	....	....	....
Total expense ...	....	....	....
Net income	....	....	....
Interest on valuation.	....	....	....

1. (a) The average selling price of No. 1 soft shells for 10 years is $0.1637 per lb. What would be the gross income of 1,000 lbs.? (b) Of 1,500 lbs.? (c) Of 2,000 lbs.? (d) Make table like the above and insert answers where they should be placed.

2. (a) The annual cost of operation is considered 6 cents a pound in a safe estimate; (b) the annual cost under "Income which competent man may hope to obtain" is 3⅓ cents; (c) the annual cost under "Favorable conditions" is

Digitized by Google

2¾ cents a pound. Find the annual cost of operation for each of the three estimates.

3. The cost of packing and marketing is 1½ cents a pound. (a) Find cost for 1,000 lbs. (b) For 1,500 lbs. (c) For 2,000 lbs.

4. (a) Find total expenses for "Safe estimate." (b) For "Income which competent man may hope to obtain." (c) For "Income under favorable conditions."

5. (a) What is a net income? (b) Find net income for first column. (c) For second column. (d) For third column.

6. (a) The net income in first column is what part of the valuation per acre? What per cent is this? (b) The net income in second column is what part of the valuation per acre? What per cent is it? (c) The net income in third column is what part of the valuation per acre? This is what per cent? (d) These per cents show "Interest on valuation." Record each in the proper column.

7. Walnut prices. The following table represents the prices as set by the California Walnut Growers' Association for the past nine years:

Year—	No. 1 Soft Shell. Cents.	"Budded." Cents.
1911	14.0	16.5
1912 (Assn. organized)	14.0	16.5
1913	16.0	19.0
1914	16.5	20.0
1915	13.6	17.0
1916	15.5	19.0
1917	20.1	24.1
1918	28.0	31.5
1919	31.5	34.0
1920	22.5	25.5

Digitized by Google

(a) What is the difference between the "soft shells" and the "budded" walnuts? (b) If you did not know, could you tell by this lesson which is the better grade? How? (c) When was the Association organized? (d) What was the per cent of increase in the price of the "soft shells" the first year it was organized? (e) What was the per cent of increase for 1917? For 1920? (f) Why were walnuts so much higher in 1918 and 1919 than they had been before?

8. Make bar graphs to show the variation in prices for these years. Use an open bar to represent one kind and a shaded bar for the other. Let a fraction of an inch equal one or more cents.

9. "No. 2 soft shells" sell for about 3¢ to 6¢ less per pound than "No. 1 soft shells." Make a table for these, showing reasonable prices for each year.

LESSON XXVIII.

THE TONNAGE OF WALNUTS PRODUCED DURING THE LAST TEN YEARS.

Year—	Tonnage.	Year—	Tonnage.
1911	12,500	1916	14,600
1912	11,250	1917	16,500
1913	11,350	1918	19,950
1914	8,900	1919	28,100
1915	14,825	1920	21,500

1. (a) How many tons less were produced in 1912 than in 1911? (b) What per cent is this? (c) How many tons less were produced in 1913 than in 1911? (d) What per cent is this of the number of tons produced in 1911?

2. (a) How many tons less were produced in 1914 than in 1911? (b) What per cent is this? (c) How many tons

Digitized by Google

more were produced in 1915 than in 1911? (d) This is what per cent? (e) What would be the average per cent of increase for the five years?

3. (a) How many tons more were produced in 1917 than in 1916? (b) What per cent is this? (c) How many more tons were produced in 1918 than in 1916? (d) This is what per cent?

4. (a) How many tons more were produced in 1919 than in 1916? (b) What per cent is this of the crop in 1916? (c) How many tons more were produced in 1920 than in 1916? (d) This is what per cent? (e) What could you say is the percentage of increase for the last five years?

5. A walnut grove is considered a long-time investment. Why do you think this is true?

6. California produces about 97% of the walnuts grown in the United States and 12% of the nuts consumed in this country. (a) What per cent of our nuts come from foreign countries? (b) Which countries send walnuts to the United States? (c) What name is given to goods sent from other countries to the United States?

Imports—	Shelled. Pounds.	Unshelled. Pounds.
1915 to 1916....	14,228,714	23,630,220
1916 to 1917....	13,058,518	25,666,844
1917 to 1918....	11,155,660	12,133,510
1918 to 1919....	10,250,890	21,235,078
1919 to 1920....	16,777,874	22,051,521

7. (a) In which year were the most shelled walnuts sent to the United States? (b) What is a reason for this? (c) In which year were the fewest shelled walnuts sent? (d) How do you account for this?

8. (a) How many times as many were sent in 1919 to

Digitized by Google

1920 than in 1915 to 1916? (Divide to one decimal place.) (b) How many times as many unshelled walnuts were imported in 1915 to 1916 than shelled walnuts? (c) How many times as many unshelled walnuts were imported in 1918 to 1919 than shelled walnuts?

9. (a) How many pounds of unshelled walnuts were imported in the five years? (b) How many pounds of shelled?

10. California Walnut Growers asked the United States Government to put a tax of 4¢ per pound on unshelled imported nuts and 12¢ on walnut meats instead of 2¢ on the former and 4¢ on the latter, as it is now. A tax on imported goods is called a tariff. (a) Do you think it would be fair to have this tariff? Why? (b) Why can Europe produce cheaper walnuts than the United States? (c) What will the American consumer be likely to demand?

LESSON XXIX.

GROWING THE GRAPE (RAISIN).

1. The climatic requirements are freedom from late spring frosts and from heavy fall rains during ripening and harvest, and, also, conditions for early ripening. Four to six weeks of dry weather are usually required following picking to permit proper drying. (a) In how many parts of California would grape culture be desirable? Locate these places. (b) Which valley ranks first in this production?

2. Distance apart of vines. When the vines are short pruned, a space of 6′ x 12′ is allowed for a vine. (a) How many square rods in an acre? (b) If an acre is 4 rods wide, how long is it? What is the length if the width is 8 rods? If the width is 10 rods? (c) How many square feet

Digitized by Google

in one square rod? How can you find out? (d) How many square feet are allowed for one vine? (e) What would be an average number of vines per acre?

3. The long pruned vines are usually given a space of 6′ x 16′. What would be an average number of these vines per acre?

4. The vines that are trellised are tied to temporary stakes that are 1¼″ x1¼″ x 3′. (a) The end of these stakes is what shape? What does it measure each way? (b) What is the length of each stake? (c) If these pieces of lumber are 24 feet long, how many stakes can be made from one piece? (d) How many pieces of lumber will be needed to stake 600 vines? (e) How many pieces would be required to stake 17 acres?

5. The supports for the Muscat and other staked varieties are 2″ x 2″ x 4′. (a) How many stakes can be cut from a piece that is 16 feet long? (b) How many pieces will be required for 450 vines? How many stakes? (c) How many pieces would be needed for 24 acres? How many stakes?

6. In preparing for market, the grapes are spread on trays, 2′ x 3′, which hold 22 pounds. These are placed in rows. Later the fruit is cured, sorted and delivered to a raisin packing house. In the Sacramento Valley the Thompson variety are clipped and dried in a drying yard. (a) If the usual crop is one ton and the good crop is 1½ tons of raisins, how many trays will be needed to take care of the crop produced on one acre? (b) On 27 acres? (c) About 20% of the crop of Muscats is used for by-products. Twenty per cent is what fractional part? This would be how many pounds?

7. Cost of producing the grape (raisin):

Digitized by Google

Value of land, raw—	
High	$300.00 per acre
Low	50.00 per acre
Usual	150.00 per acre
Developed vineyards—	
High producing	400.00 per acre
Usual producing	300.00 per acre

(a) What is meant by raw land? Developed vineyards? (b) An acre of land whose value is low is what part of an acre whose value is usual? What per cent is it? (c) The price of an acre of land whose value is high is what per cent more than the price of an acre whose value is usual?

8. (a) How many times as much does a developed vineyard cost than raw land? (b) What per cent more does an acre of high-producing developed vineyard cost than an acre of high-priced raw land? (c) What part of the cost of an acre of high-producing developed vineyard is an acre of usual producing? This is what per cent?

LESSON XXX.

Cost of establishing vineyards—irrigation system or water right included in price of land:

Clearing, leveling and preparing	$15.00 per acre
Vines (rooted @ $20 per M.)—	
Setting out	8.00 per acre
Replanting (vines and labor)	5.00 per acre

1. (a) How many vines are required for an acre? (b) At $20 per M, how much would they cost? (c) What would be the total cost per acre of establishing a vineyard? (d) This would make the price of high raw land how much per acre? (e) Low raw land? (f) The usual raw land? (g) How do these prices compare with those of developed vineyards?

Digitized by Google

2. (a) The cost of establishing a vineyard is what part of the price of an acre of low-priced raw land? What per cent? (b) Of high-priced raw land?

3. Annual cost from setting out to self-sustaining age—

Cultivating	$10.00 per acre
Stakes or trellis (first year)	24.00 per acre
Tying	2.50 per acre
Pruning, 2 years (total)	3.00 per acre
Sulphuring, 2 years	1.50 per acre
Hoeing, 2 years	2.00 per acre
Burning brush (second year)	1.00 per acre

(a) How much of the above expense comes the first year? (b) How much the second year? (c) The third year? (d) If the vines become self-sustaining in the autumn of the third year, what will be the cost of one acre for that time? (e) What would be the total expense of an acre of low-priced raw land? (f) Which would appear to be the better investment, raw land at the usual price or the same kind of land in a developed vineyard? Prove your answer with your figures. (g) Show which is better, buying an acre of high-priced raw land or an acre of high-producing developed land.

4. Annual upkeep after maturity—

Sulphur, 2 times	$ 2.00 per acre
Cultivating	10.00 per acre
Pruning and burning brush, Muscats	6.00 per acre
Pruning and burning brush, Thompsons	12.00 per acre
Suckering	1.50 per acre
Tying (Thompsons)	3.00 per acre
Hoeing, Muscats	2.00 per acre
Hoeing, Thompsons	4.00 per acre

Digitized by Google

(a) What is the total for the Muscats? (b) For the Thompsons? (c) If the length of profitable life is estimated at 20 years, what would probably be the total upkeep of the vineyard? (d) What would be the total cost exclusive of land?

5. Cost of harvest:

Gathering	$14.00 per dry ton
Handling trays	2.50 per dry ton
Turning and stacking	1.75 per dry ton
Packing in lugs	1.75 per dry ton
Hauling (4 miles)	1.50 per dry ton

(a) How many pounds in a dry ton? (b) What is the total cost of harvesting a ton? (c) Of harvesting 1½ tons?

6. Market value of yield:

High	6½¢ per lb.
Low	2 ¢ per lb.
Average	

(a) What is the average price per pound? (b) What would be the market value of one ton at the high price? (c) At the low price? (d) At the average price? (e) What would be the market value of 1¼ tons at each price?

7. Taxes and insurance—

To maturity	$1.50 per acre
After maturity—	
Average land	2.00 per acre
Good land	3.00 per acre

(a) What might an owner expect for a gross income per acre on a good yield at high market value? (b) What would be his net income?

Digitized by Google

LESSON XXXI.

STUDY OF THE FIG INDUSTRY.

1. The cost of good land suitable for raising figs varies widely. (a) Name three reasons why you think this is true.

Value of land:

Sufficient rainfall—	
Best	$125.00 per acre
Average	75 00 per acre
Irrigated—	
With water rights—	
Best	300.00 per acre
Average	150.00 per acre

(b) How much more does the best irrigated land cost than the best with natural rainfall? What per cent more? (c) What per cent more does the average irrigated land cost than the average land with natural rainfall?

2. The nearness of the water table to the surface of the land is an important point to consider in selecting land. (a) What is the water table? In the Fresno district, the Mission fig produces well where the water table comes within four feet of the surface. For Adriatics and Smyrna figs, there should be at least five or six feet of good soil above the water table. (b) How many times deeper should the water table be for Adriatic and Smyrna figs than for Mission figs? For best results the water table should not be nearer than ten feet from the surface. (c) What effect does the depth of the water table have upon the price of the land? (d) About how much more should land with a water table at the depth of ten feet be than land where it is only four feet deep?

Digitized by Google

3. Fig trees come into bearing at from five to seven years and should be in full bearing at twelve years of age. (a) How much longer does it take fig trees than grape vines to bear? (b) How much longer does it take fig trees than grape vines to become self-supporting? (c) Would this information make any difference to a man who was trying to decide whether he would buy a grape vineyard or fig orchard? How?

4. The cost of the trees varies from eighteen to thirty dollars per hundred. (a) What are the prices of the single trees? The cost of bringing an orchard into bearing will vary from forty to seventy dollars an acre when irrigation is not practiced. (b) What is the average price per acre? When trees are irrigated, the cost will run from one hundred to two hundred and fifty dollars an acre. (c) What is the average price for an acre that is irrigated? (d) Find the average cost per year for both irrigated and non-irrigated land?

5. The cost of operating a bearing fig orchard, including harvesting, taxes, interest, etc., will vary from seventy-five to one hundred dollars per acre per year. (a) What is the average price of operating a fig orchard? (b) What would be the cost for thirty-five years?

6. The yields vary. For Mission figs it is $2\frac{1}{2}$ to $3\frac{1}{2}$ tons per acre. (a) What is the average? For Adriatic and Smyrna, $2\frac{1}{2}$ to 3 tons per acre. (b) What is the average for these? Such yields may be expected to continue, under good treatment, for seventy-five to one hundred years. (c) An acre of Mission figs might be expected to produce how many tons of figs? (d) An acre of Adriatic or Smyrnas?

7. The shipping of fresh figs is only a small industry as compared with the drying of figs. The latter, if handled carefuly, should pay the grower 10% to 15% on his invest-

Digitized by Google

ment. (a) What does it cost to produce an acre of figs? (b) If figs sell for 9¢ a pound, what is the gross income from an acre? (c) What is the net income? (d) What is the profit if all the figs are dried?

LESSON XXXII.

1. When figs are grown as a border around vineyards and along roadways, the Adriatic fig, especially around Fresno, is very profitable, as the fruit can often be sold on the trees from two to three dollars per tree. (a) Let us suppose an acre of land measures 10 rods by 16 rods. If fig trees are placed 24 feet apart, how many could be planted in a border around this acre? (b) For how much could the crop from these trees be sold?

FIGS.

Duty (Underwood-Simmons Bill) 2¢ Per Pound.

	California crop.	Imports	
Year—	Pounds.	Pounds.	Value.
1894	1,640,000	7,985,959	$ 392,040
1895	2,750,000	11,855,890	587,420
1896	2,160,000	11,900,710	639,512
1897	3,250,000	8,940,762	535,380
1898	4,780,000	9,628,426	509,002
1899	5,800,000	7,284,058	356,762
1900	4,000,000	8,812,487	513,895
1901	6,500,000	9,933,871	458,513
1902	7,250,000	11,087,131	487,733
1903	6,000,000	16,482,142	775,917
1904	5,700,000	13,178,061	660,360
1905	7,250,000	13,364,107	617,027
1906	7,750,000	17,562,358	722,967

Digitized by Google

1907	6,000,000	24,346,173	1,136,924
1908	6,000,000	18,836,574	867,523
1909	7,500000	15,235,513	691,981
1910	6,250,000	17,362,197	775,319
1911	8,000,000	23,459,728	1,059,340
1912	10,000,000	18,765,408	934,763
1913	11,100,000	16,837,819	944,317
1914	10,000,000	19,284,868	941,207
1915	15,000,000	20,779,730	1,024,495
1916	16,400,000	7,153,250	315,831
1917	22,000,000	16,479,733	704,164

2. (a) How many tons were produced in 1894? (b) How many more tons were produced in 1897 than in 1894? (c) What was the increase in the California crop the tenth year after 1894? (d) How many times as many pounds were produced in 1917 than in 1907? (e) How many tons were produced in 1913?

3. Draw a bar graph showing the increase of crops from 1894 to 1917. (a) If $\frac{1}{8}$ inch = 100,000 pounds, how many pounds will a line one inch long represent? (b) How long will the line be that represents the crop for 1894 (1,600,000)? (c) How many inches will represent the crop of 1895?

4. (a) What was the average price per pound for imported figs in 1894? (b) In 1900? (c) In 1904? (d) In 1914? (e) In 1917?

5. (a) About how many times as many pounds of figs were imported in 1917 than in 1894? (b) About how many times as many were raised in 1917 than in 1894? (c) What part of the used figs in 1917 were raised? (d) What part was imported?

6. (a) What was the average crop per year for the last ten years given in the table? (b) How many pounds of

Digitized by Google

figs were used in the years 1913–1917, inclusive? (c) What was the average amount per year?

NUTRITIVE VALUE OF DRIED FIGS.

Kinds—	Water per cent.	Protein per cent.	—Carbohydrates— Nitrogen free extract.	Sugar.	Ash per cent.
California Adriatic.	25.15	4.55	10.16	?	2.29
Imported Smyrna...	21.10	?	10.28	62.60	1.86
California dried apricots for comparison	?	2.95	35.13	39.79	1.49

7. (a) What is the per cent of sugar in the California Adriatics? (b) The per cent of protein in the imported Smyrna? (c) The per cent of water in the California dried apricot? (d) Which is the better food, the California Adriatic or the imported Smyrna? How much better? (e) Which of the three has the highest per cent of ash? (f) Of protein? (g) Of sugar? (h) Which is the better food, dried figs or dried apricots? How much better?

LESSON XXXIII.

The University Junior High School was much in need of additional lockers, so it decided to do what it could to secure them. Its first move was to determine where they could best be placed. It decided upon a room 16′ 6″ x 11′ 9″. Then, in order to find the total cost, it proceeded as follows:

1. (a) Draw the above room to scale, stating the scale used. (b) On the south end (11′ 9″) there are two door openings (3′ each) one foot from each corner. How far apart are these doors? (c) How long is the line in your drawing that represents this distance? (d) How long is

Digitized by Google

the line that represents the door space? (e) At the other end, northwest corner, is a door (3′) opening into another room. Show this in your drawing. (f) On the east side, two feet from the northeast corner, is another door opening into this room. Locate this door.

2. (a) The locker selected measured 4′ 9″ in height, 1′ 6″ in width and 1′ in thickness. Find out how many can be placed along the west side of the room? (b) How much waste space does this leave on that side? (c) How many can be placed along the east side? (d) Along the north end? (e) In making your drawing of the lockers, which two dimensions do you need to know? (f) What lengths represent these two dimensions in your drawings?

3. (a) It was planned to have two rows of lockers (back to back) down the center of the room. How much open space does this leave between this row of lockers and the ones against the wall? (b) Should this center row of lockers extend all the way across the room? (c) Where should it stop? (d) How many lockers can be placed in one of these center rows? (e) In both? (f) How many lockers can be placed in the row?

4. (a) Complete drawing by placing all lockers? (b) Use nice small figures to number the lockers. (c) Where is the best place to begin and how shall you number them? (d) How are rooms numbered in office buildings? (e) Show in your drawing which way the doors open.

5. The rest of the lockers were to be placed in another room with the same dimensions as those given in the above room. The only differences in the rooms were as follows: (a) The east side of this room was like the south side of the first. (b) The south side of this room corresponded to the west side of the first. (c) The west side of this corresponded to the north side of the first. (d) Make a drawing

Digitized by Google

of this room, locating the doors and openings. (e) Show location and number of the lockers.

6. (a) How many 1½-inch boards will be needed for the backs of the lockers? (b) How long will each be? (c) How many 6-inch boards will be needed for the sides, not counting those exposed? (d) What is their length? (e) What is the length of the boards needed for the tops? (f) What is the width of these boards? (g) How many feet of molding will be required to finish the top and bottom? (h) A full-width shelf is put in each locker one foot from the top. How long should this shelf be? How wide? (i) A piece of heavy screen 8″ x 6″ is put in the door of each locker. If the screen is 2 yards wide, how many yards will be needed for all the lockers?

7. (a) The doors cost $1.35 apiece. What was the cost of all of them? (b) The hinges, locks, etc., cost 60 cents a locker. What is the cost of all? (c) The lumber, part of the labor, varnish, etc., cost $141.60. What was the total cost of the lockers? (d) This averaged how much apiece? (e) If the boys took turns in helping the school carpenter from 8 a. m. to 5 p. m., five days a week for three weeks, how many hours of work should they give? (f) How much would this have been worth at 45 cents an hour? (g) How much would it have increased the price of each locker?

LESSON XXXIV.

After the class had discussed various ways and means of raising the necessary money for the lockers, they decided to investigate a plan of selling bonds. These were some of the questions they tried to answer.

1. (a) How much money should they raise? (b) Should they charge rent for the lockers? (c) If so, what would be

Digitized by Google

a fair price? (d) For about how long should they need to borrow money? (e) What would be a fair rate of interest?

2. (a) Why not borrow all the money from one person? (b) Who would be responsible for the interest from time to time? (c) How does a bond differ from an interest-bearing note? (d) Which do you think would be better for them to use—bonds or notes? Why?

3. (a) How much money should they raise? (b) How much should each bond promise to pay? (c) This amount is always called which value of the bond? (d) Do bonds always sell at this value? (e) How much money can be made on a bond, if it is sold for more than its par value or for less than this value?

4. (a) If each bond is a promise to pay $1.00, how many bonds must be sold? (b) How many people should invest in these bonds? (c) If the bonds promise to pay interest at 6%, with payments twice a year, how much interest will the holder of one bond receive each time? (d) One who holds 8 bonds Four bonds? Nine bonds? (e) How much interest would each receive in a year? (f) A bond states the time when interest is to be paid. Select two dates for the school bonds which you think would be desirable for this purpose. (g) Why not have these bonds pay interest oftener than twice a year?

5. (a) The bonds were issued for four years. How many coupons (for interest) should be attached? (b) What would be a good size for the bond itself? (c) How large should it be, including the coupons? (d) The bonds were to be made in the school print shop from 22″ x 28″ paper. Did you select a good size for the bond? What changes shall you make? (e) How many can be made from one sheet of paper? (f) How much paper is needed for the 400?

Digitized by Google

(g) The coupons are numbered 1, 2, 3, etc. Where should coupons 1 and 2 be placed? Why?

6. (a) Another question that came up was, "Should they pay any one for selling these bonds?" What would be your answer, and the reason for it? (b) Should they sell any bonds below par? Explain. (c) A campaign was started, and the students bought all but 68 bonds which the school purchased. How many did they buy? (d) How much money did they raise? (e) How much money did the school give? (f) How much interest would the school receive on each date?

7. (a) The students voted to charge 15 cents a semester for locker dues and to make good any losses that they caused. How much money was realized from dues the first semester? (b) How much money was left after the first coupons were cashed? (c) The school decided not to accept interest on their bonds for the first year. How much money over and above expenses did they have at the end of the first year? (d) At this rate, how many years would it take for the lockers to pay for themselves? (e) Was this started as a money-making scheme? What was its purpose?

8. (a) A student who had bought $5.00 worth of bonds decided to sell them for $4.25. What was the market value of these bonds? (b) What is the annual interest on these bonds? (c) How much did the student who bought them make on his investment in six months? (d) What per cent did the first student lose if this transaction did not take place until he had cashed his first coupon? (e) How many coupons were left on each bond? (f) If all the coupons were cut off at one time and either lost or destroyed, what would be the loss to the owner of the bonds?

Digitized by Google

9. (a) How many bonds would a student need to own in order to let his interest pay his locker dues? (b) If at the end of the first semester the eighteen members of the graduating class decide to give one bond each (no coupons attached) to the school, what will be the money value of this gift? (c) This amount is equivalent to dues for how many lockers? (d) How many bonds does the school now hold? (e) Because of this, how much is saved in interest the second semester? (f) If the school wishes to redeem the bonds that the students own before it is time to make a new issue, how many should it buy, or have donated to it, each year?

LESSON XXXV.

Your height is measured in feet and inches; your weight in.....and.....; the fuel value of your food is measured in "calories." A calorie is the amount of heat that is necessary to raise the temperature of 1 pound of water 4 degrees (4^0).

The portion of food that is served at the table measures about 100 calories. This table will help you to understand.

Food.	Measure of portion.
Cooked breakfast foods	¾–1¼ cups.
Milk	⅝ cup whole; 1⅛ cups skim.
Cream	¼ cup thin; 1½ tablespoons thick.
Butter, olive oil, fat	1 tablespoon.
Bread	1 slice 3 in. x 3½ in x 1 in.
Crackers	4 large.
Fresh fruit	1 large orange or apple; 1 medium banana or bunch of grapes; 2 medium peaches or pears.

Digitized by Google

Dried fruit	4 or 5 prunes or dates; 2 dozen raisins; 1½ large figs.
Eggs	1 large; 1½ medium.
Meat (beef, lamb, mutton, veal, chicken)	About 2 ounces of cooked lean meat.
Bacon (cooked crisp)	4 small thin slices (½ ounce).
Potatoes	1 medium.
Sugar	1 tablespoon granulated, 3½ "full size" lumps.
Cocoa (made with milk)	⅔ cup.
Cream of bean soup	½ cup.
Macaroni and cheese	½ cup.
Rice pudding	½ cup.
Ice cream	¼ cup.
Sponge cake	1 large individual cake.
Sweet chocolate	About ¾ ounce.
Peas	¾ cup fresh; 2 tablespoons dried.
Beans	2¼ cups string; ⅛ cup dried.
Tomatoes	1¾ cups cooked.
Lettuce	2 large heads.

Find the number of calories in each of these:

1. Two and one-half cups of cream bean soup.
2. One cup of cocoa.
3. One pound of sweet chocolate.
4. Two and one-half cups of ice cream.
5. One large orange and two medium pears.
6. Twenty-two dates.
7. Five large figs.
8. Two cups of breakfast food, 1⅛ cups of skim milk and ⅛ cup thin cream.
9. Two and one-half individual sponge cakes.
10. Two slices of bread, one tablespoon butter and one ounce of cooked lean beef.

Digitized by Google

11. Two medium potatoes and one large egg.
12. One cup of dried beans.
13. One-half head lettuce.
14. Two cups of fresh peas.
15. Two dozen crackers.
16. Three and one-half cups of rice pudding.
17. (a) Seven cups of cooked tomatoes.
    (b) Ten cups of cooked tomatoes.
18. Six cups of macaroni and cheese.
19. One dozen full size lumps of sugar.
20. (a) Two cups of whole milk.
    (b) Four cups of skimmed milk.
21. Six medium eggs.
22. Two pounds of cooked lean veal.

LESSON XXXVI.

1. Find the number of calories in this breakfast:
   1 orange.
   1 cup of oatmeal.
   2½ cups of milk.
   2 slices of toast.
2. How many calories in this lunch?
   2 lean beef sandwiches (2 slices of bread, 1 ounce of meat).
   ¼ head of lettuce.
   1 individual sponge cake.
   1 apple (large).
3. Figure the number of calories in this dinner:
   1½ potatoes (medium).
   2 ounces of lean veal.
   ½ cup of fresh peas.
   1 slice of bread.

Digitized by Google

1 tablespoon butter.
¾ cup rice pudding.
1 cup of cocoa.

4. How many calories in the day's food?

(a) Breakfast—
6 prunes.
1 large egg.
2 thin slices of bacon.
2 slices of bread.
1⅛ cups of skimmed milk.

(b) Luncheon—
1 cup of cream of bean soup.
4 large crackers.
¾ cup of macaroni and cheese.
1 sponge cake (individual).
1 small bunch of grapes.

(c) Dinner—
1¼ potatoes.
2 ounces of chicken.
1⅛ cups of string beans.
3 large figs (dried).
⅞ cup of tomatoes.
½ head of lettuce.
⅜ cup of ice cream.
1 cup of cocoa.

5. Estimate as nearly as you can the number of calories in the dinner you ate yesterday.

6. How many calories in your breakfast this morning?

7. About how many calories do you usually bring for your lunch?

8. (a) From the table that is given, select what you think would make a good breakfast. (b) Figure the number of calories in the breakfast you selected.

Digitized by Google

9. (a) From the table select the food that you think would make a good dinner. (b) How many calories in this dinner?

10. (a) Name the things from this table that you would like to have in your lunch today. (b) How many calories would such a lunch make?

11. (a) Have one of your friends choose what he would like for breakfast. (b) How many calories in the breakfast that he chose?

12. (a) Ask your mother to select what she wants for dinner. (b) How many calories in her dinner?

13. (a) Have the one who sits opposite you choose his lunch from the table that is given. (b) This lunch would add up how many calories?

LESSON XXXVII.

TABLE SHOWING SUITABLE AMOUNTS OF FOOD.

Age in years—	Protein calories per pound.	Total calories per pound.
8– 9	3–4	30–35
10–12	. . .	28–32
12–13	3	25–30
14–17	. . .	20–25

1. (a) How many calories of protein should you eat? (b) How many should your chum eat? (c) How many are required by the pupil who sits at your right? (d) By the one who sits at your left?

2. (a) Make a table showing the number of calories of protein that are needed for any ten of the pupils in your room. (b) Show the total number of calories that are needed by the same ten people. (What TWO things must you know before you can make such a table?)

Digitized by Google

A DAY'S FOOD—SUGGESTED FOR A CHILD OF TEN.

	Measure.	Weight ounces.	Protein calories.	Total calories.
Breakfast—				
Orange	1 large	9.5	7	...
Flaked wheat	⅔ cup	6.0	1.3	...
Cream	¼ cup	2.1	9	...
Milk	¾ cup	6.4	24	...
Toast	2 slices	1.0	14	...
Butter	½ T.	0.3	..	...
Dinner—				
Hamburg Steak	1 ball	1.3	41	75
Baked sweet potato	1 potato	4.5	9	150
Bread	2 slices	1.3	14	...
Butter	1 T.	0.5	..	...
Creamed peas and carrots	½ cup	5.0	14	75
Bread pudding (with raisins)	¾ cup	6.0	18	200
Milk	¾ cup	6.4	24	...
Supper—				
Potato soup	¾ cup	6.3	22	150
Whole wheat bread	2 slices	1.4	16	...
Butter	½ T.	0.3	..	...
Stewed apples	⅔ cup	5.0	1	100
Molasses cookies	6 very small	0.7	6	100
Total for day				

3. From your previous lessons fill in the right number of calories for each of the other portions of food.

4. (a) How many cupfuls of food in all are given? (b) How many tablespoons? (c) How many slices of bread?

Digitized by Google

(d) How many different kinds of vegetables? (e) How many different kinds of fruit? (f) How much milk?

5. (a) What is the total weight in ounces? (b) What is the total number of protein calories?

6. (a) How many calories in the breakfast? (b) In the dinner? (c) In the supper? (d) What is the fuel value for the day (total number of calories)? (e) About how much does this child weigh, do you think? One of the schools in the city furnished these articles for school lunches:

Baked beans and rolls, 5¢.
Cocoa or milk, 2¢.
Crackers, 1¢.
Ice cream, 5¢.
Vegetable soup and roll, 5¢.
Creamed beef on toast and roll, 5¢.
Dates, 1¢.
Macaroni with tomato sauce and roll, 5¢.
Jam sandwich, 2¢.
Cream salmon and roll, 5¢.
Fruit cookies, 4¢.
Mashed potatoes and gravy, 3¢.
Creamed carrots and peas, 5¢.
Plain cake, 3¢.

7. These children did not spend more than fifty cents a week for their lunches. You choose a good lunch for each day, trying to have them different, and see if you can keep the week's price down to fifty cents.

Digitized by Google

LESSON XXXVIII.

TABLE I.

Number of Calories Required for Different Ages.

Age—	Calories per day.
1 year	950
2 years	1,100
2 to 4 years	1,300
5 to 6 years	1,400
7 to 10 years	1,500
11 to 14 years	1,600
15 to 16 years	2,100
17 to 18 years	2,250

1. (a) How many more calories required for a two-year-old child than for a one-year old? (b) How many more required for a child of six years than for one of four years? (c) How many more calories needed for a child of 12 years than for one of six years? (d) Why doesn't a child 12 years old need just twice as many as a child six years old?

2. (a) How many children in your family? What are their ages? (b) How many calories needed for each one? (c) What is the sum of all the calories needed?

TABLE II.

Occupation—	Calories per day.
Clerk at desk	2,250
Sales clerk, house worker	2,500
Light muscular work	2,800
Carpenter, mason	3,200
Farmer	3,500
Excavator	4,000

3. (a) A man working at which occupation needs the

Digitized by Google

fewest number of calories? (b) Which occupation requires the most? (c) Why do you think this is true?

4. (a) How many more calories are needed by a farmer than by a clerk at the desk? (b) How many more calories per day are needed by a sales clerk than by a clerk at the desk? Why? (c) How many more calories does a carpenter need than a light muscular worker? (d) What is your father's work? How many calories does he need in a day?

This table is usually given for a family of five:

Man	3,500 calories per day
Woman	2,500 calories per day
Boy (12 years)	2,500 calories per day
Girl (16 years)	2,250 calories per day
Child (8 years)	1,750 calories per day

5. (a) What is the total number of calories needed per day by such a family? (b) How many more does the father need than the twelve-year-old boy? (c) How many more does this boy need than the child? (d) How many more is allowed for the mother than for the girl?

6. (a) Are they supposing this man does heavy or light work? (b) Why does a boy need more than a girl? (c) Will this table always give the right number? Why not? (d) Which would need the more calories, a boy who sits around and reads most of time or a girl of the same age who is very active?

7. Make out a table that you think would be about right for your family.

LESSON XXXIX.

In order to know the food values of any recipe, the materials must first be weighed. This weight is then multi-

Digitized by Google

plied by the right per cent which will give the desired answer. For example:

PERCENTAGE COMPOSITION.

Protein . . . . . 3.3 per cent
Fat . . . . . 4.0 per cent
Carbohydrates . . . . . 5.0 per cent

These are the weights in grams for one cupful of milk:

Protein . . . . . 244 × .033 = ... or . . . . . grams
Fat . . . . . 244 × .04 = ... or . . . . . grams
Carbohydrates . . . . . 244 × .05 = ... or . . . . . grams

1. (a) How many protein grams are there in 2½ cups of milk? (b) How many fat grams? (c) How many carbohydrate grams?

Material—	Measure.	Weight grams.	Protein grams weight × %.
Milk	3 c.	732	732 × .033 =
Eggs	3	150	150 × .105 =
Sugar	⅜ c.	75	
Total			

Material—	Fat grams weight × %.	Carbohydrate grams weight × %.
Milk	732 × .04 =	732 × .05 =
Eggs	150 × .105 =	
Sugar		75 × 1.00 =
Total		

2. Fill blanks above with correct answers.

3. (a) Find the total weight grams. (b) The protein grams. (c) The carbohydrate grams.

Digitized by Google

TABLE FOR CALORIE YIELDS.

1 gram of protein yields..... 4.1 calories
1 gram of fat yields..... 9.3 calories

1 gram of carbohydrate yields 4.1 calories

The fuel value of 1 cupful of milk is—

Protein . . . . . $8 \times 4.1 =$ ..... calories
Fat . . . . . $10 \times 9.3 =$ ..... calories
Carbohydrates. $12 \times 4.1 =$ ..... calories

4. (a) What is the total fuel value of 1 cupful of milk? (b) What does the "8" after protein mean? (c) The "10" after fat? (d) The "12" after carbohydrates?

(Sometimes in finding the number of calories the fractions are dropped and just the whole numbers 4 and 9 are used.)

CALORIES.

Materials.	Protein carolies.	Fat weight x 9.3.	Carbohydrate weight x 4.1.	Total calories.
Milk	$24 \times 4.1 =$	$29 \times 9.3 =$	$37 \times 4.1 =$	.....
Eggs	$20 \times 4.1 =$	$16 \times 9.3 =$		.....
Sugar			$75 \times 4.1 =$	.....
	———	———	———	———
Total	.....	.....	.....	.....

5. Fill all the blanks in the above table.

MOLASSES CANDY—MAKES 35 PIECES.

Material.	Measure.	Weight grams.	Protein grams.	Fat grams.	Carbohydrate grams.	Calories.	Cost in cents.
Molasses	2 c.	640	15	..	444	1,882	6.4
Sugar	½ c.	100	..	..	100	410	1.8
Butter	1 t.	13	..	12	...	93	.9
Soda	pinch	...	..	..	...	....	..

Digitized by Google

Vinegar 1 t.	...	..	..	...	....	..
Total (cooked)						
35 pieces	...	..	..	...	....	..
1 serving						
3½ pieces	...	..	..	...	....	..
Calories per serving					....	

6. (a) How many weight grams in all? (b) Protein grams? (c) Fat grams? (d) Carbohydrate grams? (e) What is the whole number of calories? (f) The total cost in cents?

7. (a) How many pieces are allowed for one serving? (b) How many people could be served with this recipe?

8. (a) How many weight grams in one serving? (b) Protein grams? Fat grams? (c) Carbohydrate grams? (d) Cost in cents?

9. (a) How many calories per serving in the protein? (What do you multiply by?) (b) How many calories per serving in the fat? (c) In the carbohydrate? (d) Find the total number of calories in one serving.

LESSON XL.

No. 1. COCOA—SERVES FIVE.

Material.	Measure.	Weight grams.	Protein grams.	Fat grams.	Carbohydrate grams.	Calories.	Cost in cents.
Milk	2½ c.	610	20	24	31	432	7.1
Water	2½ c.	...	..	..	..	...	..
Cocoa	3½ c.	25	5	7	9	123	3.2

Digitized by Google

Sugar	2 t.	20	..	..	20	82	.3
Total (cooked)	....	...	..	..	..	...	...
1 serving	1 c.	...	..	..	..	...	...

1. (a) What is the sum of the weight grams? (b) The protein grams? (c) The fat grams? (d) The carbohydrate grams? (e) The total number of calories? (f) The total cost in cents? (Under measure, "c." stands for cups; "T" for tablespoonful and "t" for teaspoonful.)

2. (a) If this recipe serves five people, how many weight grams in one serving? (b) How many protein grams? (c) How many fat grams? (d) Carbohydrate grams? (e) How many calories? (f) What is the cost of one serving?

3. Copy above table and fill in all blanks.

No. 2. COFFEE—SERVES FIVE.

Material—	Measure.	Weight grams.	Cost in cents.
Coffee	10 T.	60	3.9
Water (boiling).	5 C.	..	..
1 serving	1 C.	..	..

When protein, fat and carbohydrate grams and calories are not given, it means there are none in the material.

4. (a) What is the whole number of weight grams in No. 2? (b) The whole cost? (c) How many weight grams in one serving? (d) What is the cost of one serving?

5. (a) How many more weight grams in cocoa than in coffee? (b) How many more protein grams? (c) Fat grams? (d) How many more carbohydrate grams? (e)

Digitized by Google

How many more calories? (f) What is the difference in the cost? (g) Which is the better food? Why?

No. 3. TEA—SERVES FIVE.

Material—	Measure.	Weight grams.	Cost in cents.
Tea	5 t.	10	.69
Water (boiling)..	5 c.	..	..
1 serving.....	1 c.	..	..

6. (a) What is the total weight in grams for No. 3? (b) The total cost in cents? (c) How much more is 6 cents than .69 of a cent? How much does .14 of a cent lack in being 1 cent?

7. (a) What is the difference in the number of weight grams between tea and coffee? (b) How much more does enough coffee to serve five people cost than the same amount of tea? (c) What is the difference in the cost of one serving? (d) At this price, how much would it cost to serve your family, with coffee at one breakfast? (d) How much for a week? (e) How much would it cost to serve your family with tea at one meal? (f) For two meals each day for a week?

8. (a) How many more weight grams in enough cocoa to serve five people than in the same amount of tea? (b) How much more will the cocoa cost than the tea? (c) Which is the better food, cocoa or tea? Why?

Digitized by Google

LESSON XLI.

No. 4. FRUIT COOKIES—MAKES 36 COOKIES.

Material.	Measure.	Weight grams.	Protein grams.	Fat grams.	Carbohydrate grams.	Calories.	Cost in cents.
Shortening	½ c.	96	1	82	..	...	3.9
Sugar	1 c.	200	..	..	..	...	2.9
Egg	1	50	7	5	..	...	4.0
Molasses	½ c.	160	4	..	111	...	1.8
Milk	1 T.	14	..	1	1	...	
Flour	2¼ c.	266	29	3	199	...	2.9
Baking powder	2 t.	6	..	..	..	...	.5
Raisins	1 c.	160	4	5	122	...	4.
Cinnamon	1 t.						
Nutmeg	1 t.	...	..	..	..	...	.3
Cloves	1 t.						
Salt	1 t.						
		—	—	—	—	—	—
Total (cooked) 36 cookies		...	..	..	..	...	...
1 serving 4 cookies		...	..	..	..	...	...
(1 cookie)		...	..	..	..	...	...
			—	—	—		
Calories per serving			..	..	..		

1. (a) How many cupfuls of different things are used in these cookies? (b) How many tablespoons? (c) How many teaspoons?

2. (a) What is the sum of all the weight grams? (b) Of the protein grams? (c) Fat grams? (d) Carbohydrate

Digitized by Google

grams? (e) How many calories in all? (f) What is the total cost in cents?

3. (a) How many weight grams in one serving? (b) Find the number of protein grams in one serving. (c) How many fat grams in one serving? (d) Carbohydrate grams? (e) What is the cost in cents for one serving?

4. What is the sum of all the calories per serving?

No. 5. CHOCOLATE FUDGE—MAKES 25 PIECES 1¼ IN. SQ.

Material.	Measure.	Weight grams.	Protein grams.	Fat grams.	Carbohydrate grams.	Calories.	Cost in cents.
Sugar	2 C.	400	..	..	400	....	6.7
Milk	¾ C.	183	6	7	9	....	1.9
Butter	2 T.	24	..	24	...	....	2.4
Cocoa	6 T.	42	9	12	16	....	3.8
Vanilla	½ T.	..	..	..	..	....	1.3
Salt	pinch	..	..	..	..	....	
Total 25 pieces (cooked)		...	..	..	...	....	..
1 serving 2½ pieces		...	..	..	...	....	..
Calories per serving			..	..	...		

6. (a) Find the total weight grams in the above recipe. (b) The protein grams. (c) The fat grams. (d) The carbohydrate grams. (e) What is the sum of all the calories? (f) What is the total cost in cents?

7. (a) How many square inches in one piece of fudge? (b) How many square inches in 25 pieces? (c) About how large a greased pan would it take to hold this fudge?

8. (a) How many pieces in one serving? (b) How many people could be served with this recipe?

9. (a) If you wanted to make enough to serve 25 people,

Digitized by Google

how many cups of sugar should you use? (b) How many cups of milk? (c) How much butter? (d) How many tablespoons of cocoa? (e) How many teaspoons of vanilla?

10. (a) How many weight grams in one serving? (b) How many protein grams? (c) Fat grams? (d) Carbohydrate grams? (e) What is the cost in cents for one serving?

11. What is the total number of calories per serving?

Digitized by Google

Digitized by Google